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A Record of Achievement

Plants of the Becker Oven Type in the United States and Canada

	LOCATION	No. OVENS
COKE PLANTS		
U. S. Steel Corp.	Clairton	366
Carnegie Steel Company	Gary, Ind.	138*
Illinois Steel Company	Youngstown, O.	61
Republic Iron & Steel Co.	Birmingham, Ala.	57*
Republic Iron & Steel Co.	Weirton	37
Weirton Steel Company	Provo	33
Columbia Steel Company	Warren, O.	47
Trumbull-Cliffs Furnace Co.	Painesville, O.	23
Diamond Alkali Co.	Buffalo, N. Y.	114
Bethlehem Steel Company	So. Chicago, Ill.	110*
By-Product Coke Corp.		
GAS PLANTS		
Battle Creek Gas Company	Battle Creek, Mich.	11
Consumers Power Company	Saginaw River Plant	19
Consumers Power Company	Jackson, Mich.	15*
Winnipeg Electric Co.	Winnipeg, Canada	17
Utica Gas & Electric Co.	Utica, N. Y.	21
Northern Ind. Gas & Elec. Co.	Fort Wayne, Ind.	19*
Lynn Gas & Elec. Co.	Lynn, Mass.	11*

*Under Construction.

In Less Than Three Years—

Less than three years have elapsed since The Koppers Company's Becker type combination coke and gas oven was introduced. In this time contracts for seventeen installations totaling 1099 ovens of the Becker type have been received. Eleven of these plants are now in operation, demonstrating in actual practice that this type of oven is a marked improvement over all previous types from the standpoint of design, construction and operation.

THE KOPPERS COMPANY
PITTSBURGH, PENNA.

NEW YORK CITY
120 Broadway

CHICAGO, ILL.
Peoples Gas Bldg.

IRON TRADE REVIEW

Cleveland, O., April 2

Vol. LXXVI *No. 14*

FIG. 1—This is the latest device for providing a rapid and controlled quench for bolts and rivets. It represents a practical application of the important investigations of Roy H. Smith, vice president, Lamson & Sessions Co., which indicated that steel of 0.15 per cent or less carbon responds in a remarkable way to sudden quenching. Tensile strengths as high as 160,000 pounds per square inch can be obtained on low-carbon steel by means of this equipment.

Drastic Quenching Imparts Surprising Properties To Bolts and Rivets

By E. L. Shaner

WHEN an article fails in service, the faith of the user in its quality is shaken. Under certain conditions, if failures are repeated with undue frequency, distrust falls not only on the manufacturer of the defective items, but also on the entire industry.

A striking example of this tendency was provided a number of years ago when the shoddy malleable castings made by a few irresponsible foundrymen caused railroad executives to lose faith in the quality of malleable. The roads practically abandoned the use of this type of casting and the blow almost wrecked the malleable industry. It required the co-operative effort of the malleable foundrymen for more than a decade to win back the lost prestige of their product.

While the danger is not acute, a similar situation exists in the bolt industry. The ordinary method of forming and treating bolts, as practiced by most manufacturers, is far from perfect. Heating and quenching operations depend so much on the vagaries of the human element that it is not surprising that occasionally poor bolts are produced.

Unfortunately, when a bolt or rivet breaks unexpectedly, the purchaser unconsciously registers a black mark against the bolt and rivet industry. Occurrences of this kind break down confidence, and as a result all bolt makers are made to suffer indirectly for the sins of a relatively few offenders.

Several years ago, after giving considerable study to bolt failures, Roy H. Smith, vice president of the Lamson & Sessions Co., investigated the possibility of obtaining more desirable physical properties in bolts without adding appreciably to the

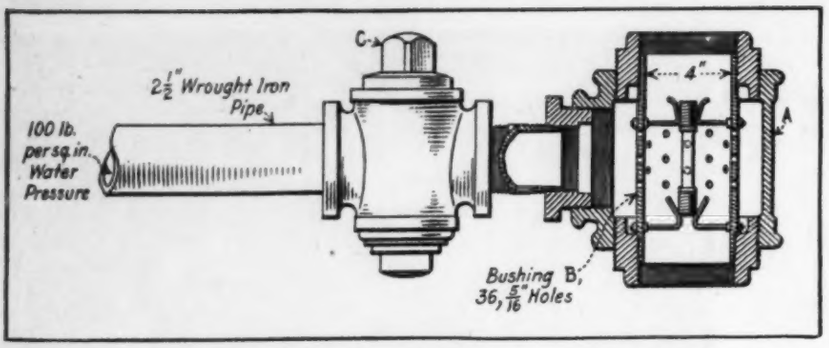


FIG. 2—LABORATORY APPARATUS USED IN FIRST INVESTIGATION ON THE EFFECT OF RAPID QUENCHING

cost of treating them. The main thought underlying this work was that the heating and quenching should be simplified and controlled so that uniform results could be obtained by ordinary unskilled workmen.

Experience extending over many years had indicated that the methods of heating and quenching them in common use did not offer sufficient safeguards against dangerous variations in the temperature and speed at which the bolts were quenched. With good practice, steel containing not over 0.15 per cent of carbon could be made to show a tensile strength of about 60,000 pounds per square inch. It was felt that if the conditions of the quench could be more accurately controlled than was possible in the ordinary method of dropping the bolts in still water, a higher strength could be obtained.

In order to test this theory, apparatus for producing a drastic quench was set up at the laboratory of the Falls Rivet works of the Lamson & Sessions Co. at Kent, O. Specimens of steel containing 0.13 carbon, 0.51 manganese, 0.01 phosphorus and 0.043 per cent sulphur were cut to 5-inch lengths, threaded at both ends and ground to a diameter of 0.505 inch for a length of 2½ inches between the threaded ends.

These test specimens were heated in a lead pot heated by an electric furnace, the temperature being accurately measurd by a portable potentiometer. The time of heating varied from four minutes at 2300 degrees Fahr. to 25 minutes at the lowest temperature range. An effort was made to quench the pieces as soon as the temperature was reached.

The quenching device is shown in Fig. 2. It consisted principally of a 2½-inch wrought iron pipe leading from a high-pressure fire line, a straight-away valve *C*, and a 6-inch tee shown at *A*. A bushing *B*, was provided with thirty-six 5/16-inch holes to permit entrance of water from all sides. The heated specimens were placed in the jig as shown, supported by light wires.

In taking a specimen from the lead bath with a pair of tongs and placing it in the jig, then turning on the water, an appreciable time elapsed which apparently affected the results at all temperatures, especially the higher ones. To overcome this, a ¼-inch hole was tapped in the end of each specimen. This permitted withdrawing the specimens from the furnace with a ¼-inch rod instead of with tongs.

The results of one of the tests, which were originally reported in a paper presented at the annual meeting of the American Society for Testing Materials in 1924, are plotted in Fig. 3. The conclusions, drawn from the laboratory investigation, as published in that paper were as follows:

"The results of these experiments show that the tensile strength is increased con-

EACH point on the curve represents the average of three tests, which were conducted as described in the accompanying article. All specimens were normalized, but no connection between the normalizing and subsequent response to heat treating could be traced except at the lower temperatures.

The tensile strength goes up practically in a straight line until about 1300 degrees, at which point it rises abruptly, with another marked rise near 1600 degrees Fahr. The curve clearly indicates the serious range from 1300 to 1450, which accounts for failure of many bolts treated by present methods.

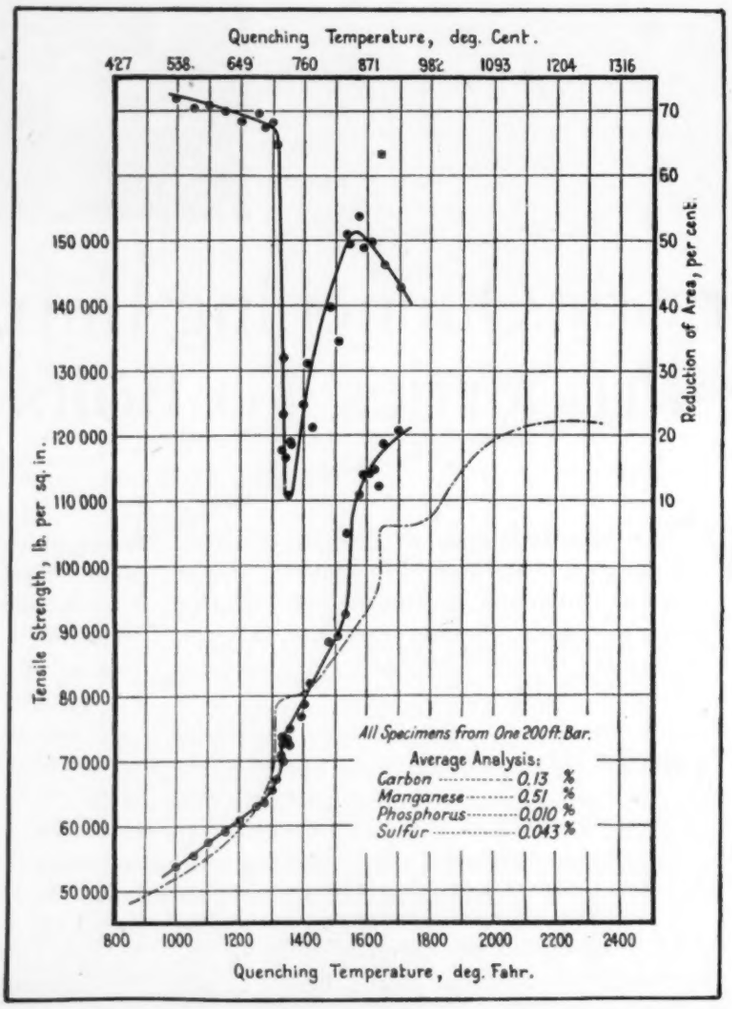


FIG. 3—RESULTS OF DRASTIC QUENCHING OF LOW-CARBON STEEL. NOTE ABRUPT CHANGES AT 1300 AND 1600 DEGREES

tinuously from about 48,000 pounds per square inch with a quenching temperature of 860 degrees Fahr. to about 150,000 pounds per square inch with a quenching temperature of 2400 degrees Fahr. The reduction of area decreases suddenly at the lower critical temperature. It seems well established from the tests and from our practical experience that the strengths indicated by the curves at the various temperatures can be secured and fairly well maintained in practical commercial or tonnage production without objectionable brittleness.

"A wide choice in relation between the tensile strength and the reduction of area is possible by properly co-ordinating the heat treating and the drawing temperatures. For example, it is possible to make a rivet or bolt with a tensile strength of 100,000 pounds per square inch with a reduction of area of more than 50 per cent. Similarly, a tensile strength of 70,000 pounds with a reduction of area of more than 70 per cent is practicable.

"The results, except at the two critical temperatures, are also consistent with Howe's statements: 'In case of low carbon steel the tensile strength seems to increase with rapidity of cooling without limit,' and 'As the rapidity of cooling increases, so does the tensile strength increase continuously, and the ductility decrease but more suddenly.' I have not found other writers to emphasize these characteristics of low-carbon steel, and apparently no commercial or practical use has heretofore been made of them."

The rather remarkable performance of bolt steel subjected to the rapid and controlled quench in these laboratory tests encouraged Mr. Smith to attempt to repeat the results on a commercial scale. The heat treating equipment of the plant at that time consisted of several gas-fired rotary furnaces equipped with the usual discharge apparatus for plunging bolts or rivets into a still bath.

The old quenching tank was removed from one of the furnaces and a woven wire catch basin installed in its place. This basin was hinged and connected to the furnace drum by a rod and cam device so that the basin was dumped at each revolution of the furnace. Water was delivered to the basin through a 4-inch pipe equipped with a valve to regulate its flow. When desired, approximately 300 gallons per minute could be poured into and over the wire basin.

With this equipment, steel registering a tensile strength of about 60,000 pounds per square inch by the old method, consistently showed strengths of from 80,000 to 100,000 pounds. But although these results were gratifying, and it was possible to obtain strengths up to 160,000 pounds under favorable conditions, it was felt that the equipment fell far short of exhausting the possibilities of drastic quenching.

One of the difficulties was in connection with the quantity and distribution of the water. Experience with the laboratory tests had clearly showed the necessity for a copious flow, because the 1½-inch pipe first used had to be replaced with one of 2½-inch diameter in order to carry the required volume. For this reason a 4-inch delivery line was used in the first commercial equipment. But while this provided some 300 gallons per minute, which seemed ample, an observer standing a few feet from the quenching water occasionally could see a bolt remain red hot in the shower of water an appreciable time. This indicated that dead pockets existed in the water, and of course was a factor seriously interfering with the rapidity of quench desired.

To overcome this difficulty and to improve the control of other conditions, a second furnace was equipped for rapid quenching. The arrangement of the water line, control valve, quenching tank, etc. is shown in Fig. 1. The water flows from the delivery pipe into a annular header which has numerous holes drilled on its inner face. These throw the water toward the center, forming practically a solid body of water through which the hot rivets fall to a wire screen disk. This disk is hinged and connected so that it dumps at each revolution.

The furnace is equipped with automatic temperature control, insuring quenching at the proper temperature. As far as can be determined there are no dead spots in the quenching column as was the case in the first equipment. As a result of these refinements, the bolts being treated show surprisingly uniform physical properties. Moreover, the strength can be changed at will by varying the amount of water, no change in the furnace temperature being required.

This ease of control can best be illustrated by reporting an actual test made several days ago. Without giving advance notice, the author went to the heat treating department and picked up three bolts from the quench. Upon inquiry, the furnace operator stated they were expected to show a minimum tensile strength of 80,000 pounds per square inch. He was asked to quench four or five bolts so that the strength would correspond to a minimum of 70,000 pounds. Without a word, he gave the control valve a turn, reducing the volume of

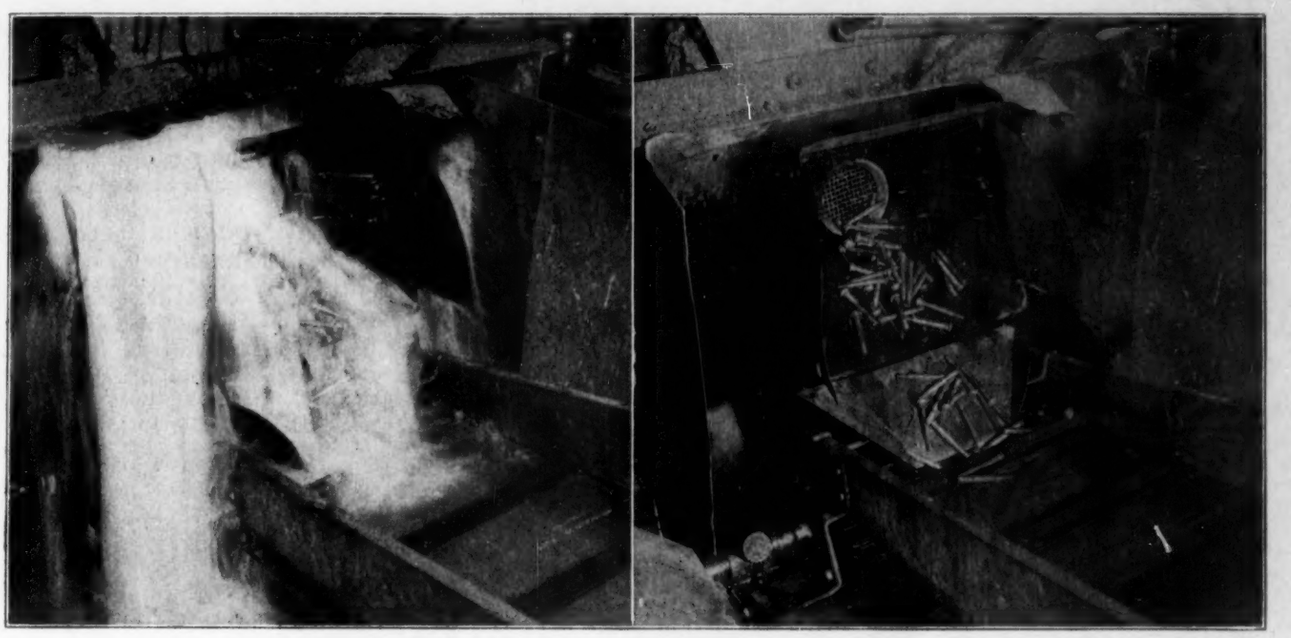


FIG. 4—FIRST COMMERCIAL EQUIPMENT DESIGNED FOR RAPID QUENCHING AT THE LAMSON & SESSIONS PLANT AT KENT, O. FIG. 5—THE SAME EQUIPMENT WITH WATER SHUT OFF SHOWING TILTING BASKET IN WHICH RIVETS FALL DURING QUENCHING OPERATION

water slightly. Five bolts were taken from this quenching.

When pulled in the laboratory, the first three bolts, which were 7/16-inch in diameter and of about 0.12 per cent carbon, broke as follows:

Bolt No.	Broke at, pounds	Tensile strength lbs. per sq. in.
1	7,600	80,800
2	8,000	85,100
3	8,200	87,200
Average	7,933	84,366

The five bolts, quenched in a lesser flow of water, broke as follows:

Bolt No.	Broke at, pounds	Tensile strength lbs. per sq. in.
1	7,200	76,500
2	7,100	75,500
3	7,200	76,500
4	7,000	74,400
5	7,100	75,500
Average	7,120	75,680

These results show how easily the strength may be varied by this method of quenching and how uniformly the bolts break.

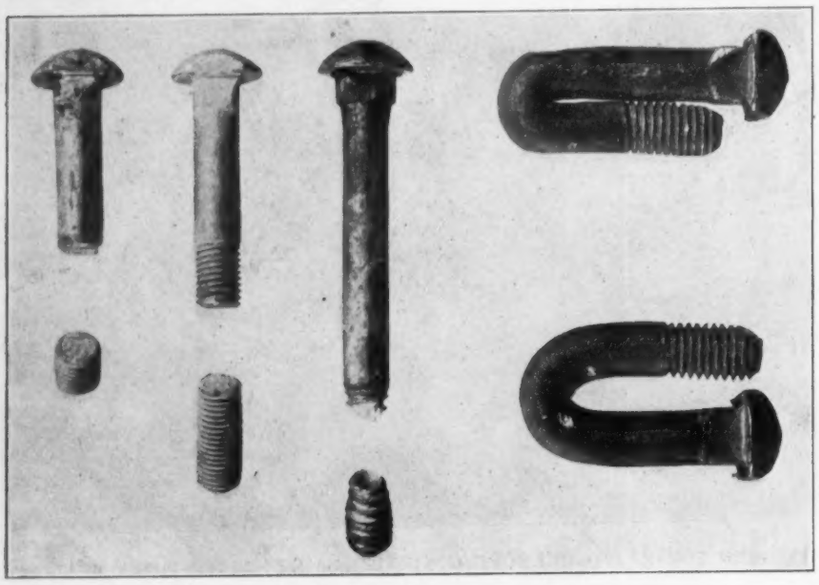


FIG. 6—EXAMPLES OF BAD AND GOOD QUENCHING

The two bolts at the left broke at a low stress. They were quenched at a temperature in the dangerous range between 1300 and 1450 degrees Fahr. Note the brittleness indicated by the fracture and the absence of reduction of area. The bolt in the center broke at 89,000 pounds per square inch, has a good fracture, and desirable reduction of area and elongation. The two specimens at the right show the extremely good properties of bolts quenched at the proper temperatures. These were ½ inch in diameter and have a tensile strength of about about 85,000 pounds.

Of the five gas-fired rotary furnaces, now being operated at the Kent plant, one is equipped as shown in Fig. 4, one as in Fig. 1, two with the ordinary quenching equipment, and one with a modification of the usual type for rivets. The original commercial quenching device now is used only for bolts requiring minimum strength. All work involving higher than minimum strength goes through the improved quenching equipment shown in Fig. 1.

Two quenching liquids have been used with unusual success. Bolts and rivets to be galvanized are quenched in water, because it helps to remove the scale and leaves the surface better prepared for the zinc coating. All other work is quenched in a soluble oil heated to about 180 degrees Fahr. and under a pressure of about 30 pounds per square inch. In addition to its excellent quenching properties, this oil forms in a thin coat on the bolts, giving them a velvety black appearance. The oil does not rub off easily and for this reaosn it has proved to be a very effective rust resistant.

Circulation of the quenching fluid is accomplished by a multi-stage, centrifugal pump. The oil or water drains from the quenching position into a 100-gallon tank beneath the floor, from which it is pumped back into the delivery pipe A new furnace and auxiliary apparatus to be installed soon, will be equipped with a larger tank so that better control over the heat of the quenching medium can be maintained.

The results of the new method are indicated in Fig. 6, where the bolts at the right show unusual properties.

Develops New Process for Resistance Wire

The Electrical Alloy Co., Morristown, N. J., recently developed a new process for producing bright resistance wire. This wire is made of 80 per cent nickel and 20 per cent chrome and a number of heat treatments are necessary in reducing the material from wire rods to wire. By the new process, the material is kept free of oxidation. It continues a bright product during the stages of reduction and is delivered to the consumer as a bright wire. This product is employed as resistance wire in electric toasters, flatirons, heaters, etc. The company sometime ago installed a 10-inch, 3-high rod mill, and it makes the rods from metal melted in a battery of electric furnaces at the plant.

Directory of Engineers

A directory of engineers in the United States and in all the other English speaking countries of the world, under the title "Engineers" will shortly be issued by S. C. Dickerhoff, Jr., Inc., Philadelphia. The book will list over 220,000 engineers classified in 24 groups with information as to their official duties and connections. The directory also will list approximately 38,000 corporations, giving detail as to their location and business and a list of all the officials and engineers connected with each of these corporations and indicating the position of each. Considerable engineering data will also be included. The book is designed to serve as a reference volume. Mr. Dickerhoff several years ago, prepared and issued an iron and steel flow chart.

Will Display Tools

An exhibition of modern machine tools of the line it carries will be conducted by the Motch & Merryweather Machinery Co. at its demonstrating rooms, 130 Seventh street, Pittsburgh, April 17 to 25. These machines which have the latest motor drives, will be shown in operation between the hours of 10 a.m. and 10 p.m. each day.

Plant Nears Completion

Construction of the steelworks furnaces of the Tennessee Coal, Iron & Railroad Co. at Fairfield, Tenn. has been completed and the brickwork now is being dried out. The plant includes four 100-ton open hearths and is expected to be placed in operation in April. L. C. Henkel has been appointed superintendent of the open-hearth department.

To Consider Safety

The administration board of the Ohio State Foundrymen's association has decided that the annual session of the association will be held at Cedar Point, O., the latter part of August or early in September.

Safety work engaged the major portion of attention at the recent meeting of the board. Complying with an invitation from the American Foundrymen's association, it was decided that the Ohio organization will be represented at the annual meeting in Syracuse in October and that a paper will be prepared on the subject of safety, to be presented in the name of the Ohio foundrymen. A. J. Tuscany, 5713 Euclid avenue, Cleveland, is secretary.

Designing the Pickling Department for Economy in Maintenance

By C. A. Crawford

CLEANING metals with acids to remove oxide and dirt is a widely employed operation in all branches of industry. The practice has been used for many years and has become generally identified by the trade term, "pickling." This to most metal workers is understood to mean cleaning metals with acid solutions. More usually it refers to the use of sulphuric and hydrochloric acids. To many in industry the term pickling means cleaning metals or metal articles in hot or warm solutions of sulphuric or muriatic acid which are of relatively high dilution. It is the use of these two acids that come into the consideration of this article.

Every manager, pickling department superintendent, and maintenance engineer, today knows that the number and variety of causes which affect the unit pickling cost are large. Perhaps in no other class of manufacturing operations are there as many hidden sources of expense and loss which de-

This is the first of a series of three articles dealing with pickling practice and equipment. The author, C. A. Crawford, is associated with the International Nickel Co., 67 Wall St., New York.

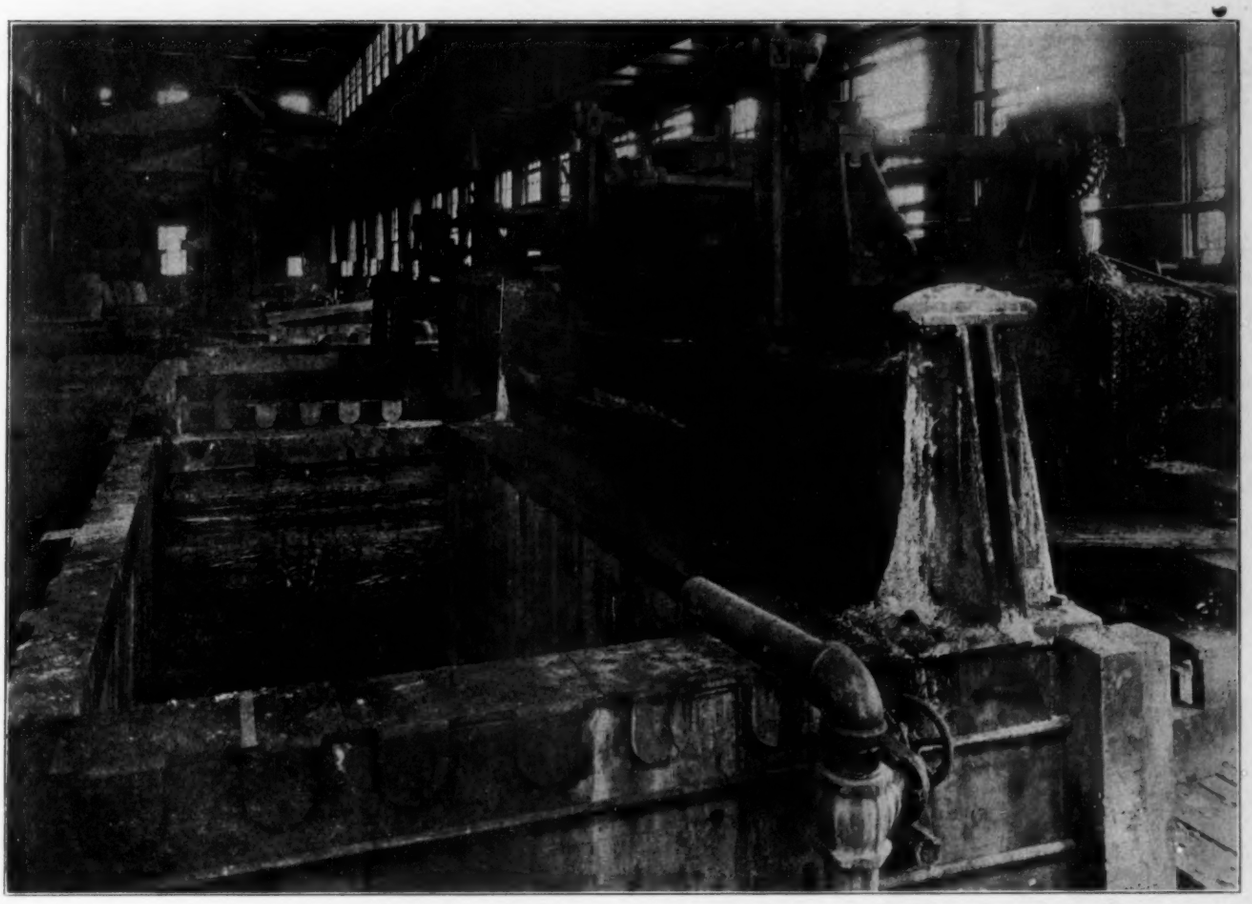


FIG. 1—TYPICAL PLUNGER TYPE PICKLING TANK SHOWING THE CONSTRUCTION, SCUFF PLATES, RELATIVE LEVEL ABOVE THE FLOOR, ETC.

mand perpetual vigilance to hold in check. Skill and experience in design in the selection of materials and in methods of maintenance of pickling department equipment enable large savings in production costs.

The operating efficiency and unit cost of daily pickling operations are affected by the decisions of those who lay out the pickling department long before construction operations are begun. The location should be in the natural path of movement of the factory product through its several operations. The principle of continuous flow through plant departments is nowhere more important than here. A moment's consideration will show why this is so. On account of the corrosive fumes of pickling baths, overhead cranes are rapidly destroyed by corrosion and the cost of maintaining them is so high in pickling rooms that they are not generally used.

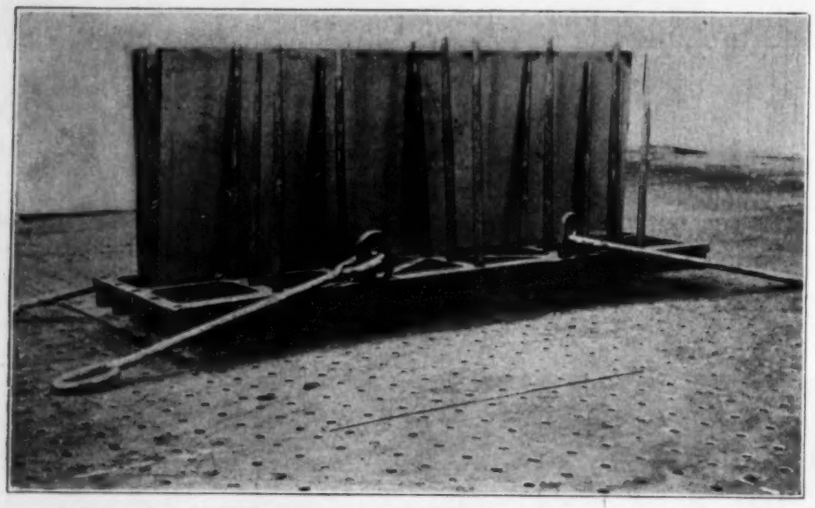


FIG. 2—PICKLING ROOM FLOOR OF PERFORATED CAST-STEEL PLATES WHICH, BEING LEVEL, AFFORDS EASY MOVEMENT OF TRUCK LOADS OF SHEETS

In the absence of traveling cranes, hand power or floor tractors must be relied upon to bring the material in and out of the pickling room. As the character of loads is heavy every foot of transfer by these laborious methods that can be saved is reflected in lower costs. Back-tracking always should be avoided because of the chances of confusion and delay. Delays of any sort are costly in the pickling room because the dissolving of iron and the consumption of acid are going steadily on. The engineer responsible for the layout of a pickling department will do well to provide maximum convenience and continuity of flow of the product in and out.

The floors in and near a pickling room should be sound, strong, level and smooth and built to remain so. Ruts and grades in a floor over which heavy loads must be moved by hand power or tractor introduce obstinate delays which, if frequent, increase the pickling cost appreciably. The effect of the continuous soaking with water and acid and the pounding of heavy loads on tractors will prove destructive to any floor not well and durably built on a substantial foundation and substructure. Any manager who has seen an entire pickling crew called away from their proper work to struggle with a truck load of steel stalled by a grade or rut in the floor, while time and acid are wasted, steel burned up, and production delayed will need no further urging to have the pickle room floors built soundly from the start and kept in good repair.

Proper ventilation of the housing above the pickling tanks should be provided to carry off the vapor which, in cold weather, may become a dense fog totally impenetrable to vision with consequent danger of accidents. Dripping of the condensed acid vapor from above is annoying to workmen beneath, in a measure that will affect the cost sheet. The ventilation should be carried out with consideration of the possibility of destructive corrosion of the roofs of adjoining buildings by the pickle house fume. The acid fumes are corrosive and rapidly eat out iron or steel structural work. The trusses and roof of building bathed in pickling fumes can be made of wood, waterproofed with resinous or asphalt paints. This type of construction probably is more economical in the long run than steel, which cannot be protected fully against the acid fume no matter how frequently or carefully painted.

Good draft to carry off the fumes should be provided by a deep stack construction in the roof. Application of some of the modern aspirating ventilator heads is helpful. These can be built in corrosion resistant metals. Fans are less useful because of corrosion difficulties in the rotating parts.

The placing of the foundation for the pickling tanks to provide for adequate drainage is important. Spent liquors when run out of the tanks should pass freely to the sewer or disposal plant. Sometimes this is overlooked and the lower portion of the tanks allowed to rest in a sump of spent liquor which drains away slowly. This is particularly destructive to the pickling tank timbers and bolts and becomes a source of expense and loss through leakage at the part of the tank least accessible for inspection and repair. The foundation usually is laid so that the top of the tank is from 18 to 30 inches above the floor level. Such settings permit maximum facility for working the tanks.

In many states there are statute regulations bearing on the pollution of streams. These prohibit the dumping of spent pickle liquors into rivers. The spent liquors may be converted into sulphate of iron or neutralized with lime or settled on filter beds. Pickling tanks can be made of four general types of construction, namely, wooden tanks, solid concrete tanks, jointed chemical brick tanks or metal plate tanks.

Temperature Changes Affect Service

The solid concrete tanks are not impervious. It is almost impossible to construct them without small interstices where seepage can start. They gradually become saturated with the liquor and this reduces the strength of the concrete from 25 to 30 per cent and eats away the steel reinforcing. Expansion and contraction due to the temperature changes of pickling service, as well as the seasonal weather changes, including the danger of freezing in winter, causes cracks to form which it is not practical to calk. The concrete breaks under mechanical abuse.

Accidental dropping of a crane load or striking with the swing of a pickling machine may break or crack a concrete tank wall. Such accidents may seldom occur, but as the concrete tank must last in different classes of service from 3 to 10 years to justify its cost, and since one accident may start an irreparable leak, the hazard, nevertheless, is present. The use of asphalt or tar compounds to waterproof the concrete tanks is not fully effective. The hot pickle solutions soften and float off the tars of low melting point while those of high melting point, which resist the hot pickle, are brittle when cold and crack

under expansion and shock. The wood linings, which sometimes are used, do not fully protect the walls.

What has been said about the destructive effect of expansion and contraction, of mechanical shock and of the impractibility of repairing leaks also applies to jointed brick tanks. The water tightness of these vats rests upon the soundness of a multiplicity of joints. Two types of effective materials for bonding these joints that have been tried are the sulphur cements and the acidproof hydraulic cements. The former is a relatively brittle material and small cracks are almost certain to start which develop into serious leaks long before the economical service life of the tank is attained. The newer acidproof cements appear to be more flexible and more durable. The usual method of constructing these jointed tanks is to set the blocks against a supporting shell of poured concrete. The face inside of the blocks may be washed finally with melted sulphur but this practice is of doubtful value. Reliance can more safely be placed on careful matching and bonding at the joints.

Lead Lining Sometimes Used

The use of pickling tanks constructed of metal plates have not been tried to any large extent. In some special cases steel plate tanks with lead linings have been used. This is effective in unagitated pickling where elaborate precautions can be taken to eliminate the chance of accidental puncturing, or tearing of the lead lining. The hazard of pinhole leaks in the lead sheet or in the seams always is present and may lead to undetected corrosion of the steel plates and ultimate destruction of the tank. Small tanks made of acid-resistant sheet metals have been tried with fair success. These depend upon the effectiveness of the joints or seams. Standing seams bolted or riveted on the outside and solder-filled on the inside are better than welds because they permit more ready inspection and repair. It usually is impossible to repair a leaky weld satisfactorily, especially in the acid-proof metals which are a little refractory under the welding torch or arc. Tanks of acid-proof metal plate should have a wider and wider application as experience is gained in the details of joining. Such tanks are 100 per cent tight as long as no perforation at the seams occurs.

The material most widely used in the construction of pickling tanks is wood timbers which are bolted together with acid resisting metal rods. Wooden tanks after many decades of use have proved to be the most effective and most economical for holding pickling solutions, and the leading position of wooden tanks in this field has never been seriously challenged by any other type of design. Under ordinary conditions the engineer responsible for the layout of the pickling house can safely rely upon the wide experience of the pickling industry and choose bolted wooden tanks, as the surest method of holding the pickling solutions.

The two types of design of wood tank generally used include the rectangular tank, bolted in three directions; and the oval or stave construction, in which the wall timbers are fitted vertically like the staves of a barrel, and pulled up by rods or hoops running around the outside. The latter

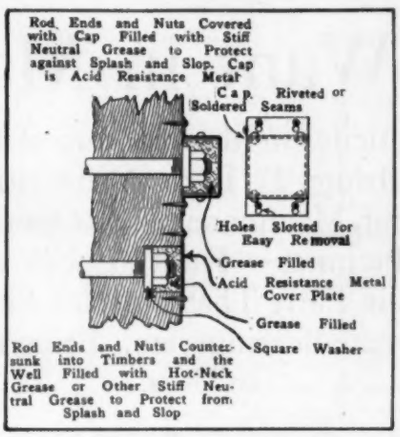

Rod Ends and Nuts Covered with Cap Filled with Stiff Neutral Grease to Protect against Splash and Slop. Cap is Acid Resistance Metal
Cap Riveted or Soldered Seams
Holes Slotted for Easy Removal
Grease Filled
Acid Resistance Metal Cover Plate
Grease Filled
Square Washer
Rod Ends and Nuts Countersunk into Timbers and the Well Filled with Hot-Neck Grease or Other Stiff Neutral Grease to Protect from Splash and Slop

FIG. 3—DEVICES WHICH HELP PROLONG THE LIFE OF A TIE ROD

type is usually higher in first cost per unit of capacity and requires more skill to repair. If carefully fitted of selected timber and vigilantly maintained tight by regular drawing up of the hoop rods, these tanks will endure longer than any other design, and justify the higher first cost. Pliable rods of a strong acid-resistant metal should be used for hoops on these tanks, because an economical life of the timbers can be had only by maintaining the joints in watertight contact to prevent rotting and the starting of leaks at the seams.

Cheap Rods False Economy

The use of a tie rod that is not permanently strong enough to hold the timbers in tight contact is false economy. The permanence of the strength of the hoops must not be overlooked. Those metals which are subject to fatigue failures, crystallization under continued strain or localized corrosion of the "plating-out" or cementation variety, introduce the danger of unsuspected loosening of the tank. The use of the oval tanks is limited to certain classes of work, such as in wire mills and tin mills, and often its shape is not suitable to meet the service conditions. In these cases rectangular bolted tanks are used.

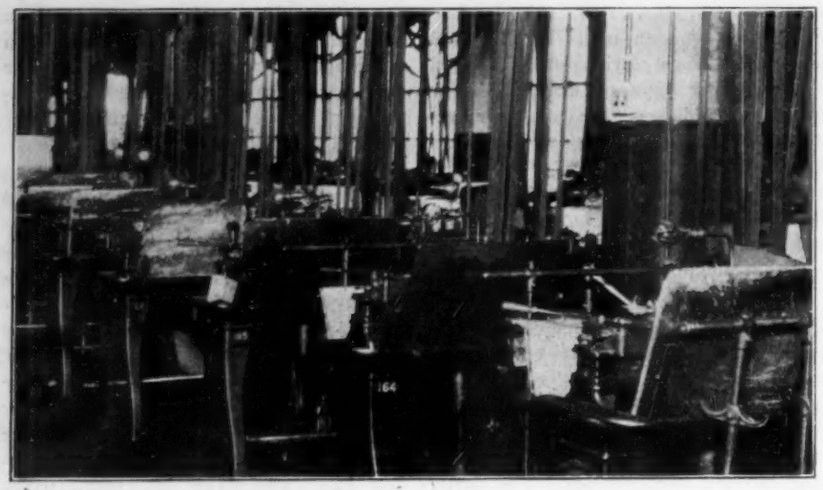
Wood Is Largely Employed

By far the largest proportion of all the tanks used to hold pickling solutions through all branches of industry are the rectangular, bolted wooden tanks. These include all sizes and dimensions from the large vats used for tubes, rods, and structural shapes, through the medium sized but massive sheet mill tanks, the slightly smaller tin mill tanks and on down to the small and light tanks used for cleaning steel stampings and small parts. Well seasoned timber of good quality must be selected of such sizes as are amply large for the tank in view. It is better to err on the high side and have the timbers of large cross-section rather than too small.

If it is borne in mind that the life of the tank as a whole is inextricably bound up in the life of the timbers, as well as of the bolts or tie rods the importance of careful selection of both timber and tie rod will be obvious. A porous or split timber or one that is not strong enough to hold its original position under the load of the pickle solution will allow every joint to loosen. Seepage, through loose joints, will reach the tie rods and weaken them by corrosion. A tie rod that is too weak either through inherent low tensile strength of the metal chosen, or because of too small cross section, or one that weakens under stress through metallic fatigue will permit the timbers to spring apart.

That it is false economy to buy a cheaply constructed pickling tank is obvious after studying leakage losses. Tanks tested each week by filling with water and measuring the drop in level with all outlets closed for a period of one or more hours can be kept fairly free of leaks. Unless such tests are made with regularity it will not be unusual to find a leakage loss of five pounds of acid per ton of steel pickled. This is equivalent to a drop of 1 inch an hour on a 7 x 13-foot tank of 7½ per cent sulphuric acid. On a set of sheet mill tanks that will handle 100 tons of steel each day and may last 500 working days, 5 pounds of acid per ton of output at $0.005 a pound for acid amounts to a loss of $1250 by leakage during the life of the vats. This compares with a possible saving of $200 to $400 by the purchase of a tank cheaply bolted.

(*To be continued*)



AS STATED in the current report in the March 19 issue, the machine tool meeting of the Chicago section of the American Society of Mechanical Engineers was unusual in that users as well as makers discussed problems of the design and operation of tools. Engineers responsible for installing, maintaining and operating thousands of machines in two of Chicago's largest plants presented their experience as users. One of these speakers, Robert R. Keith, chief engineer of motor trucks and busses, international Harvester Co., named several weak points in machine tools. His remarks are presented in abstract in the accompanying

What Users Want in Machine Tools

Experience in Manufacture of Tractors Brings To Light Difficulties in Layout, Maintenance and Operation of Machines—Faulty Lubrication, Repair Parts That Do Not Fit, Inadequate Bearings, etc. Bring Grief to User.

By Robert R. Keith

IN CHICAGO we are manufacturing tractors at the rate of about 60 complete units daily and about an equal number of engines for tractor or other use. Our operations are of a manufacturing rather than a jobbing character. Therefore the following observations have more to do with what is commonly known as intensive manufacturing than with any jobbing possibilities.

One of the first experiences we meet in arranging a plant for production is that of placing the tools so that the work may be handled efficiently. At Chicago we encountered difficulty because some of the machines had working heights varying greatly from those of their neighbors. To remedy this condition holes have been dug in the floor, sometimes as much as 4½ inches. In a few cases the floor has been taken out entirely to obtain the necessary drop to bring the work tables on a level. This brings attention to the lack of possibility of raising and lowering to working height of some machines used in production lines.

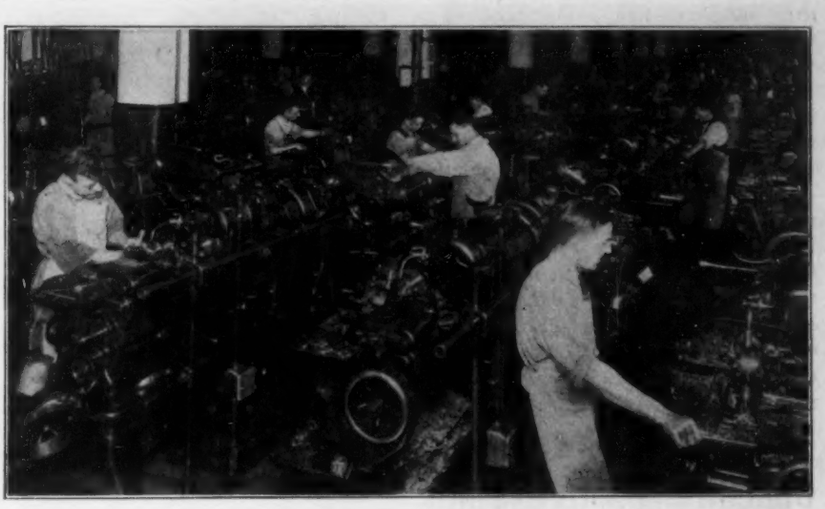
The next consideration is application of the power. Invariably the driving pulley has a fixed position. The machine is set parallel to line or at right angles to it, and usually it is set in any but the desired way. This suggests the possible use of a primary bevel gear drive, preferably spiral gears, so arranged that the carrying arm for the pulley is on a swivel, which will permit of its being turned at whatever angle may be required.

Maintenance difficulties usually arise from two sources. One is the inadequacy of the oiling devices. Lubrication offers one of the richest fields for further improvements. In a few machines the oiling systems are splendidly worked out; in others they are semi-prepared in that the mechanism is enclosed and a pump is furnished to flood oil over the bearings; but in other machines the oil holes, with little plugs are drilled so that they are directly in line for the chips to rest on them, the result being that if they find the hole and pull the plug the chips fall in to the detriment of lubrication. This condition it seems, is inexcustable in high-grade tools.

A second factor in maintenance arises from wear or weakness in design. In case of breakage, the user is obliged to make the parts necessary to repair the break or buy them from the builder. It happens in more cases than I would like to state that the repair parts furnished by the builder will not fit. That condition has come about in our experience so many times that in certain makes of machine tools we go to work and make the pieces, because we know that the part furnished will not fit. Strict interchangeability of parts, especially those called upon frequently for repairs, would be desirable.

After a certain length of time a machine tool gets into a state where it is a question as to whether it is profitable to continue its operation, whether it had best be put into an operation where the service is not so severe, whether it best be sold and a newer machine purchased, or whether it should be rebuilt. This is a problem that must be decided in each case on its merits. In general, I believe it is being found profitable to rebuild machine tools and put them back into serviceable condition. Sometimes, if not often, this can be done from 5 to 20 per cent of the original cost.

article. Undoubtedly they were offered as constructive criticism and although many builders may differ with him on certain points, there can be no question but what many of the faults he mentions are daily encountered by other users. Mr. Keith's paper, as well as that by J. R. Shae, superintendent of development Western Electric Co., should serve to pave the way for a better understanding between builders and users. The accompanying illustrations, showing screw machine departments with belt and individual motor drive, are from Mr. Shea's paper, which deals with progress in design as viewed by users of machines.



Touching upon a few of the defects found in the regular operation of machine tools, I recommend thought be given to locking devices or adjusting rings that really lock. Another point of trouble is the inadequacy of loose pulley bearings. It may be of interest to know that we are gradually replacing all of the old-style standard loose pulley designs with an inserted ball bearing sleeve, which is packed with lubricant about once a month. We have been able to get rid of five regular oilers by these changes.

Severe work brings to light the bearing provisions of a machine tool. In many cases we find the bearings do not stand up. I believe this often is due to the fact that the designers do not base their calculations on the strains incident to the operation of dull high speed steel tools under high feeds. This surely should be the basis or such calculations, because machines frequently are operated part of the time with the cutters dull.

A large part of the work covered in the Chicago plant is on gray iron, and in some ways gray iron is as mean a material to work with as we find because of its tendency to produce chatter. That brings out weaknesses in design where the torque strains are carried through long shafts or spindles, and especially is that true in boring operations. Turning cast iron is relatively easy because of the way the chips come off the tool, but in boring they crowd up and crumble and start chattering difficulties.

It seems strange that machine tool builders who are making machine tools for the purpose of manufacturing accurate gears themselves use gears that are what one of our mechanics calls "notched blanks." In fact, in the bevel gear field a machine tool with a spiral bevel gear seldom is encountered.

An old trouble that seems to be well in hand now was the weakness of the overarms on milling machines. That has been approached from two or three angles by different designers with splendid results. We still find, however, on the ordinary drills inadequate arm supporting tables and tables themselves much too light. The high speed steel tool, especially if dull, imposes strains that arms and tables apparently were not designed to carry on the milling machines, although the overarms have been strengthened to a point where they are quite satisfactory.

In tools where tool slides are used, such as vertical boring mills, horizontal screw machines and other tools of that type, we still find weaknesses in the design of the slide and its bearings that necessitate frequent rescraping and relining. The tendency, however, of the design in general is to get away from that condition and some of the newer ones are at least apparently beyond criticism.

In the turret type of tools there have been some marked improvements in the method of locking the turret to the base.

A few years ago quite a bit of fun was poked at the idea of incorporating a flywheel, in designs for metal cutting tools, the notion being that a fly wheel belongs on an engine. It does, but it also belongs on a machine tool. Surprising results have been obtained in several cases where we have put in a flywheel in the driving train so as to absorb chatter and steady up the cut. We all know the life of any cutting tool is in a great measure controlled by freedom from chatter.

Another interesting opportunity for development lies in radial drills used for heavy work. These drills are not intensive manufacturing tools especially, yet they meet certain conditions in this kind of work unusually well. However, the movement of the radial drill arm is slow; the mass is great and it takes time to move the spindle and the arm from one position to another. It is interesting to go in a machine tool salesman's room and be able to put your finger against the arm and move it, but when you are trying to move from hole to hole, the pieceworker is battling with the inertia of the arm. It seems possible that this could be helped by means of friction driving mechanism that would respond to the push and pull of a handle and help to move the arm from one position to another.

The use of the self-contained automatic flooding systems for the lubrication of bearings and the same type of system for circulating the cutting lubricant is obviously a line of development of considerable interest. Many attempts have been made to supply lubricants to a system of tools or a number of them in groups from one common source, but I believe this plan has been abandoned because it ties up tools so that they can't move from one position to another. Moreover, the cutting lubricant circulating system itself is usually full of trouble, occasioned by the settlement of dirt in the pipe lines. Therefore the self-contained cooling systems constitute a splendid answer to that trouble.

Offers Fellowships

Four research fellowships in mining and metallurgy at the University of Missouri, Rolla, Mo., are being offered by the school of mines and metallurgy of the university in co-operation with the Mississippi Valley experiment station of the bureau of mines. The fellowships are open to graduates who have the

equivalent of a bachelor of science degree and have had proper training in mining, metallurgy, or chemistry, and who are qualified to undertake research work. The income of each fellowship is $800 per year for the 12 months beginning July 1. The purpose of the research work is to undertake the solution of definite problems confronting the mining and metallurgical industries of Missouri. The following subjects will be studied: Metallurgy of zinc; refractories for metallurgy of zinc; and physical metallurgy, including heat treatment of steel. Applications should be addressed to director, school of mines and metallurgy, University of Missouri, Rolla, Mo.

Bulletin Explains Eyesight Conservation

"More than 60 per cent of all persons gainfully employed in the United States have defective vision," it is stated by the Eyesight Conservation council in a new booklet on this subject, Bulletin 5. "No physical defect contributes more directly to fatigue and inefficiency than eyestrain, or is more responsible for waste of vitality, effort, time and material.

"Sight is an important factor in accident prevention. Over 14 per cent of all industrial accidents result in injuries to the eye. Sixteen and one half per cent of the total blindness in the United States is attributable to accidents. Wherever eye hazards exist in industry they should be recognized and suitable protection for the eye provided. The results of safety campaigns show high reductions in eye accident cases.

"The 1910 census showed that there were 57,272 blind in the United States. The 1920 census indicated that there were 52,617 blind in the United States. This was a substantial reduction although our population had increased nearly 14,000,000 in the ten years. This reduction indicates beyond question a great improvement due to preventive measures and precautionary methods against accidents.

"The matter of illumination is closely associated with defects of vision and accidents. Improper illumination is one of the important causes of eyestrain, eyestrain may be both a cause and a result of defective vision.

"Many accidents result from the inability to see properly, insufficient light may be the cause, so may defective vision, so may glare resulting from improper light. At least 15 per cent of all industrial accidents may be definitely traced to improper lighting."

The bulletin is of special interest to safety engineers. It is replete with illustrations and examples pertaining to eyesight conservation in workshop, office, schools and homes.

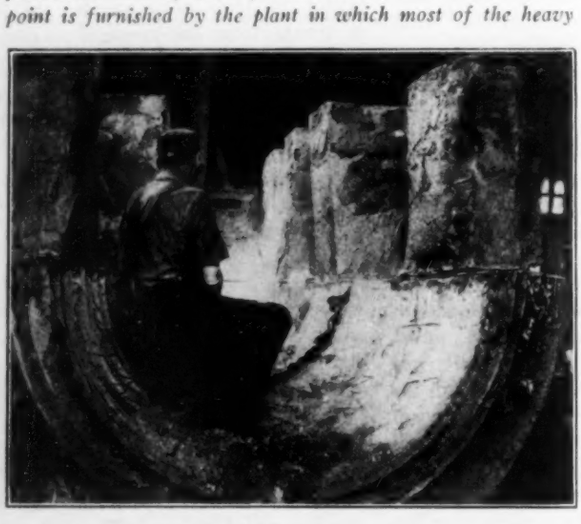
Abrasives Show Gain

During 1923 the abrasive industry enjoyed general prosperity in common with the other mineral industries, as compared with the two years preceding, according to the geological survey report "Abrasive Materials in 1923," by Frank J. Katz. All varieties of abrasives covered in the report shared in the increase in output. The production of garnet, emery and artificial abrasives probably marks more clearly than that of most other materials the general return to activity in industry. Aside from this showing of healthier tone in the business, there were no changes that merit special note.

Cutting Process Aids Foundry Work

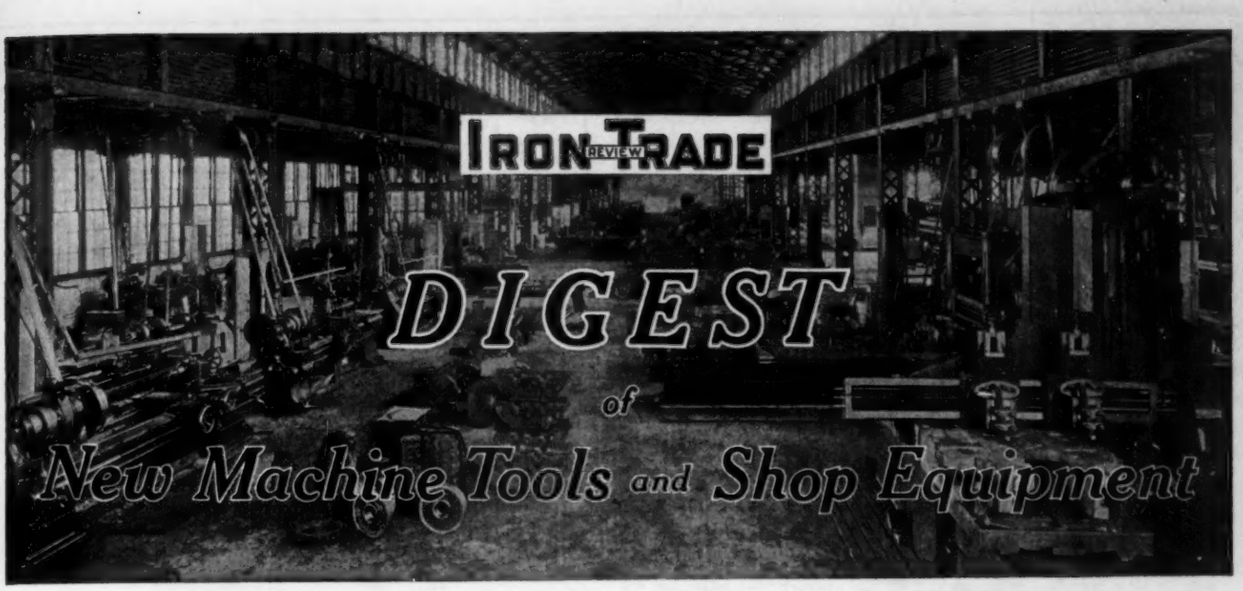
OXYACETYLENE cutting has enabled foundrymen to be entirely independent of former limitations as to size and location of gates and risers because the cutting blowpipe reaches any portion of the casting with equal facility. Knowing this, it has been possible to redesign entirely the gating of troublesome castings, along logical lines, with the result that defectives are limited. Thus many plants in this country are today making castings of sizes and types which it would have been impossible to produce before the advent of the oxyacetylene cutting blowpipe.

Foundrymen have not only enlarged their range of production; but have increased the efficiency and reduced the production cost of their former run of work. A case in point is furnished by the plant in which most of the heavy cutting consists in removing risers ranging from 8 to 10 inches up to 20 inches. The steam turbine cylinder casting shown in the accompanying illustration is an example. In this work the risers vary from 12 to 20 inches thick. One man with a blowpipe could probably have cut these risers within a reasonable time; but the management realized that such work was not a one-man job. They had studied the problem and concluded that additional money spent on labor and equipment would be returned in the final finishing. A machine cutting blowpipe with a straight line machine as accessory now is employed. The machine is operated by a cutter and two helpers. One helper maintains the proper gas supplies and pressures and the other assists in holding the cut to the proper line. Cuts made in this way are smooth, close to the line, and require a minimum of time for final finishing.



A more fundamental development at this plant is in the design of their larger molds particularly large marine gears which weigh 40,000 pounds rough cast. The risers do not take the customary shape of stems with projecting heads, but form an almost continuous ring about the top of the casting. The six segments are separated only by a narrow space. Good quality steel for the face of the gear, where clear, clean steel is most needed, is supplied at every point by a generous pool of hot metal just above. The improvement in the quality of the work is natural. This method of pouring is contingent upon the oxyacetylene process to cut the risers smoothly and economically.

Such results clearly illustrate that foundries can increase the scope of their production by thorough study of the possibilities of the oxyacetylene process and at the same time better the quality of their steel castings while operating at a lower net cost.



Build Tools for High Production

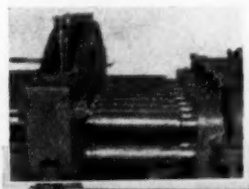
MANY machine tools purchased 10 years ago may be producing as efficiently today as they did when first placed in operation. Compared with tools of present-day design, however, their rate of production is considerably smaller. Two factors are directly responsible for the increased output, namely, development of cutting tools and refinement in machine design.

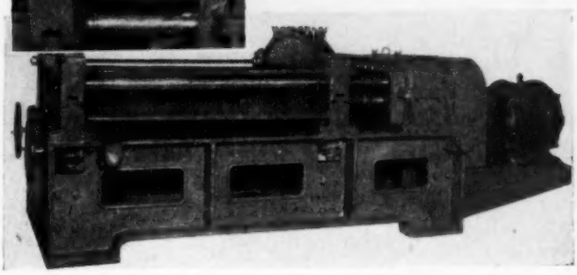
It is said that a machine tool only is as good as its cutting tool. Since the introduction of high speed steel, progress has been made alternately in cutters and machine tools, a progress similar to that of armor plate and armor piercing projectiles. Armor plate was developed as protection against gun fire but as penetrating projectiles were designed, armor plate was thickened and strengthened. Everyone is familiar with the progress made

Roller Leveler Reduces Vibration

ITR No. 58

The Aetna Foundry & Machine Co., Warren, O., recently has introduced a roller leveler developed for use in full finish sheet mills as well as in jobbing mills where sheets are leveled directly off the mill. The leveler is built in 48, 54 and 60-inch sizes, this being the width of rolls between housings. The rolls, of which there are 17 of 4⅜-inch diameter, can be made of any steel or hardness specified. They are driven by a new type universal coupling from a gear box running in oil. This coupling, a closeup of which is shown in upper left hand corner of the illustration, is of ball and socket type and is made in such a way as to insure against end vibration, back lash or looseness, regardless of whether 31 or 10-gage sheets are being leveled. A positive coupling is necessary in full finished sheets to overcome the tendency of the leveler to make chatter marks on the surface of the sheets. The leveler is portable.

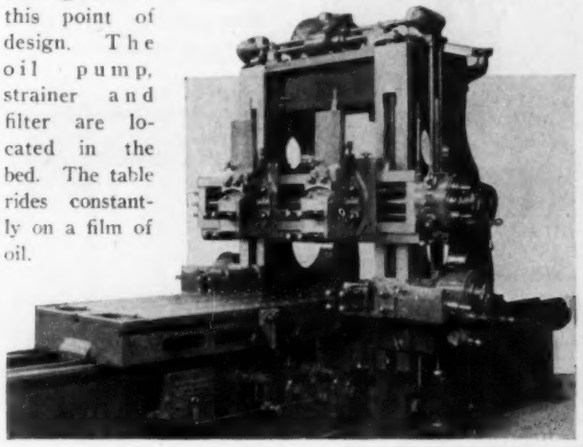




Planer Features High Production

ITR No. 59

The Cincinnati Planer Co., Cincinnati, has just announced a new planer having features designed to increase production materially. Convenience for the operator, simplicity, elimination of delicate wearing parts and safety features are shown in the dial feeding mechanism, rail lift and rapid power traverse to the heads. All heads have selective dial feeds graduated in units of 1/64 inch and are arranged so that any feed up to 1-inch can be set from the operator's position and read from the front of the machine. A single turn rail clamping device is used. The bed is double the table length so that at the maximum stroke the table does not overhang. Continuous lubrication is applied to all parts, considerable attention having been given to this point of design. The oil pump, strainer and filter are located in the bed. The table rides constantly on a film of oil.



Cold Saw Cuts Metals with Speed

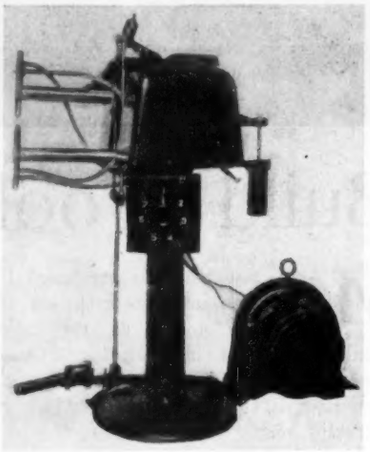
No. 60

The Hunter Saw & Machine Co., Pittsburgh, Pa., has brought out a high speed circular saw for cold cutting metals such as small light section beams, channels, angles, brass, copper, structural and welded tubing, etc. The motor and saw blade are mounted on opposite ends of a tilting frame, a belt passing over an idler wheel being used for transmitting the power. Both the belt and saw are fully protected with guards. The saw is fed down through work by an offside hand lever attached to the forward end of the tilting frame. The table is provided with a graduated quadrant stop that can be set to any angle within the sweep of the saw blade used. This stop is held firmly in position on the table by a bolt and T-slot. Material is clamped by a quick-acting accentric jaw. Operating speed is 1750 revolutions per minute, this giving a speed of 20,000 feet per minute on a 20-inch diameter saw. The motor is 7½ horsepower.

Builds Spot Welding Machines

No. 62

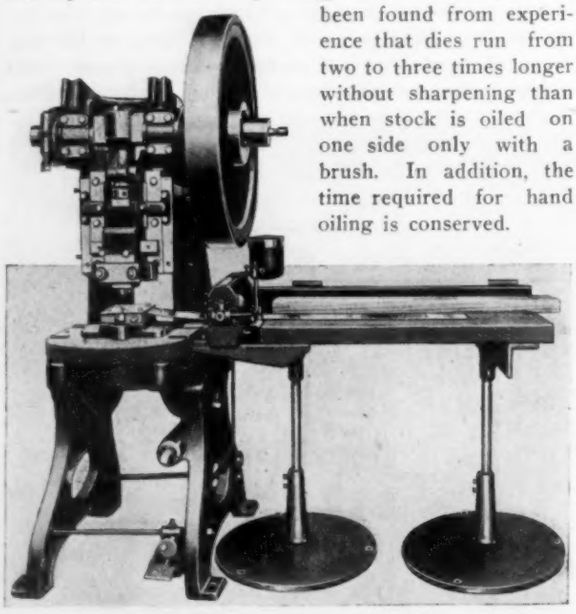
The Ames Co., Brooklyn, N. Y., manufactures a line of machines for general spot welding. Five different sizes are built, all operating on alternating current, usually 220 volts 60 cycles. Where direct current only is available it is necessary to use a rotary converter or motor-generator set. As shown by the illustration, welding is done between two jaws operating like pliers. The lower jaw, or horn, is stationary, while the upper jaw is lowered by the foot pedal. After the work is gripped in the jaws, further depression of the foot pedal turns on the current, thereby causing the metals to be heated instantly to a fusing temperature. Current is cut off and the work removed by releasing the pedal. Actually the work is held between two electrodes mounted in the jaws. The main part of the welder is the transformer, the function of which is to transform the 220 volts applied down to between 1 and 6 volts. This renders the machine harmless, eliminating the danger of shock.



New Stock Table Aids Press Work

No. 61

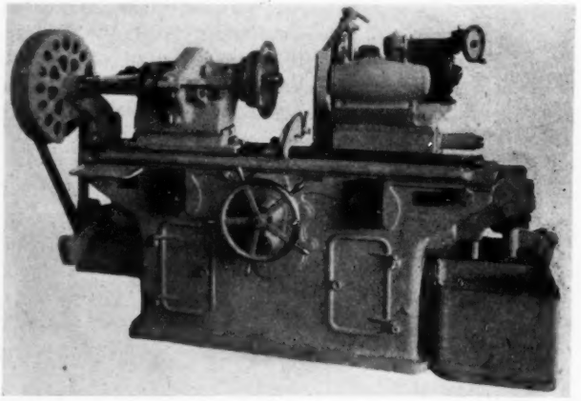
The F. J. Littell Machine Co., Chicago, has brought out a combination stock table and oiler which is adjustable to any height of press. It can be inclined at an angle and because of its heavy bases does not require bolting down to the floor. Thus it can be moved from one press to another at will. The oiling attachment oils the stock on the top and bottom. By oiling in this manner, it has been found from experience that dies run from two to three times longer without sharpening than when stock is oiled on one side only with a brush. In addition, the time required for hand oiling is conserved.



New Machine Grinds Brake Drums

No. 63

The Landis Tool Co., Waynesboro, Pa., has designed machines equipped specially for grinding automobile brake drums, both internal and external. Use of balloon tires and four-wheel brakes makes accuracy of drums imperative. The tendency is to make the drums from higher carbon steel which makes a finish by grinding desirable. The illustration shows the front view of the machine arranged for internal grinding. So as not to use a cup grinding wheel, the wheel head has been thrown at an angle and the wheel is dressed off at an angle with the diamond located at the back of the wheel. The machine carries a 10-inch diameter wheel rigidly mounted on a heavy spindle. The machines both have direct motor drive.



first by one branch and then by the other, and the fight for supremacy still going on.

So it is in the machine tool industry. High speed cutting tools necessitated the design of stronger machines and each successive development in high speed steel has called for stronger and more powerful machinery. Today, machine tools are designed with sufficient power and ruggedness to accommodate future development of cutters. During this process of increasing capacities, designers of metal cutting machines have refined their designs, metal has been removed from one place and added to another, parts subjected to heavy wear have been strengthened and improved bearings applied; more efficient control apparatus and interlocking features have been provided; and better means of lubrication has been effected.

Production Costs Vital

Newly designed machine tools invariably bear the ear marks of high production, for tool manufacturers recognize that as the chief sales aid. The tool producer usually has no trouble in convincing the wide-awake machine tool consumer that the increased production of a new machine will justify the investment for the new and abandonment of the old. During periods of keen competition, such as this country now is experiencing, the margin of profit is low and production costs are vital.

A number of the new machine tools and much of the shop equipment brought out during March feature high production. A striking example is the new planer designed by the Cincinnati Planer Co. and described in the accompanying digest as No. 59. Convenience for the operator, simplicity of design, elimination of wearing parts and fool-proof arrangement to eliminate liability of breakage is shown throughout construction of the dial feeding mechanism, rail lift and rapid power traverse to the heads. Selective dial feeds are furnished to all heads, being graduated in units of 1/64 inch and arranged so that any feed up to 1 inch can be set from the operator's position and read from the front of the machine. Rail and side heads each have a separate feed with a safety feature so they can be fed into each other without breakage. A single turn rail clamping device operates through a crank handle at the end of the rail. It is impossible to engage the elevating mechanism while the rail is clamped. Automatic stops limit the maximum travel of the rail.

All control levers operating the rapid traverse, rail clamp, rail lift and feed adjustments are placed so that the operator need not change his position to handle any of them. The bed is double the length of the table, eliminating overhang at maximum travel. The housings are designed not only with wide faces but so that the heavy thrust of side head tools is taken by a square section through metal to metal contact. Further to increase rigidity at maximum heighth, the housings are tied together at the top by a full-depth box arch.

Continuous lubrication of all moving parts has been given special attention. A pump located in the bed takes oil from the tank through a strainer, then passes it through a filter. Oil is forced into vees near the center of the bed and distributed through channels full length of the table so that the table rides constantly upon a film of oil. An abundance of oil always is present on short and long strokes, the overflow forming a head which flushes out the vees.

Wider Range Is Provided

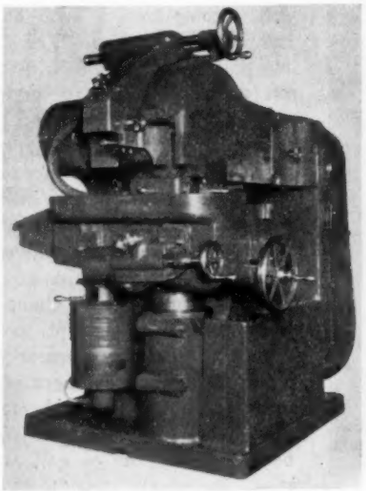
To cover a larger range of work than possessed by its standard horizontal boring mills, the Defiance Machine Works has designed a special horizontal boring, milling, drilling and tapping machine. It is described as No. 79 in the digest. This machine is built massive and has ample weight and strength in the base and column. One of the features of the machine is the base which is provided with outboard supports carrying hardened steel track on which rollers under

(*Continued on Page* 919)

Centerless Grinder Is Redesigned

No. 64

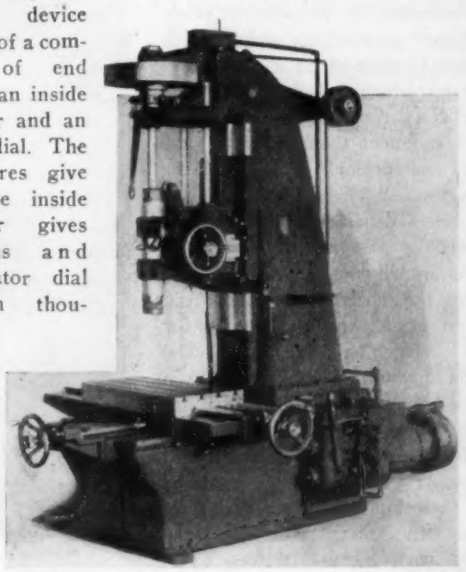
The Detroit Machine Tool Co., Detroit, recently has redesigned its centerless grinding machine and incorporated in it a number of new features. The grinding wheel is positioned directly above the feed wheel, the work resting of its own weight on the feed member. The feed wheel is twice the width of the grinding member so that the work is rotated before it reaches the grinding station and also after it leaves the grinding wheel. Work passes through the machine by the action of the feed wheel and it is held in place accurately during grinding by front and rear guide plates. The feed wheel unit can be pivoted on its axis in angular relation to the axis of the grinding wheel. Control of the cut is obtained by raising or lowering the entire feed wheel unit, this altering the distance between the guides. The machine is completely motor driven. Lubrication is automatic.



Jig Boring Machine More Rigid

No. 65

The Pratt & Whitney Co., Hartford, Conn., has introduced a new design of its jig boring machine, one of the chief improvements of which is a new column of heavier construction to provide maximum rigidity. The column head has been changed to conform to the new column. Floor space has been conserved by a redesign of the spindle speed gear box. The table is equipped with transverse and longitudinal slides, both being equipped with slow motion and rapid traverse. Each slide is provided with a measuring device consisting of a combination of end measures, an inside micrometer and an indicator dial. The end measures give inches, the inside micrometer gives thousandths and the indicator dial gives ten thousandths.



Large Uses of Steel In Small Ways

BELLS! Bells! Bells! Hear the bells! Mankind in this civilization is ruled by bells. He is timed, advised, alarmed by bells, warned, signaled, directed, summoned and kept honest by bells.

A moment's reflection shows how great a part of daily life is associated with bells of one sort or another. Man rises from his rest at the sound of the bell on his alarm clock. The tones of his dining room clock warn him the time has come to start for his office or shop. He hears the street car gong as he approaches the corner where he embarks. The starting bell announces to the motorman that he is aboard. At the railway crossing a bell warns of an approaching train and averts an accident. The fire engine dashing by to answer an alarm tapped out on bells in the station house, clangs its gong that the streets may be cleared.

At the street crossings where traffic is regulated bells announce the signal is to change. In his office building, Mr. Man presses a button that rings a bell in the elevator. Perhaps he punches a time clock and sounds a bell. His telephone comes to life and summons him by its ring. The typewriter in his office tells when the line is ended by the sound of a bell. On his desk is a series of buttons which ring bells or buzzers to summon his assistants. When he goes to lunch payment of his check is rung up in a cash register on which a bell sounds. He seeks a friend at his hotel. A bell summons the bellboy to page the one desired. In the large business establishment his request to see a department head is followed by a signal tapped out on bells in all parts of the plant to bring the official to his office. And when he has returned home for the evening the neighbor who calls announces his arrival by a bell. Thus his whole day has been one of using or answering bells and he has been guided through a multitude of situations by their tappings, answering their summons automatically for the most part, because of long association. About 8000 tons of steel are used annually in the production of electric bells. It is estimated that about 6,000,000 bells are produced each year. About half of them are ordinary door bells. The other half is composed of bells and buzzers for a large variety of purposes. Included are railway signal bells, police and fire alarms, telephone bells, street car bells, radio and pullman car buzzers, dumbwaiter buzzers, door and call buzzers, elevator annunciators and many other similar devices.

The average electric door bell contains about a quarter of a pound of steel. The bell going into the other classifications differ much as to size; some of them are several feet high and much heavier. It is likely the average weight outside of the door bell class is around five pounds of steel each. These bells for the most part are alike in construction, the only difference in most cases being that heavier gage material is used for the manufacture of large bells. Many large bells also have cast frames or bronze gongs, while the average bell is made throughout of rolled steel.

The frame for the average door bell is stamped out of .045-inch sheet steel by means of roll or hand-feed power presses. The covers are stamped in the same way from .015-inch sheets and the gongs from .040-inch sheet steel. For the wire induction coils the cores are ⅛-inch cold-rolled rounds. The armature is stamped out of .0625-inch sheet steel in the same way as the frames, covers and gongs. The round hammer knob at the end of the armature, which actually comes in contact with the gong and produces the sound, is stamped out in the form of a three-leaf clover and formed into a knob at the end of the armature. The binding posts to which the wire from the contact buttons are attached are steel screws provided with brass nuts. Use of bells for various purposes is increasing each year as telephones, railroad crossing signals and other devices are made more universal. Development and change has seemed to cause little change in the use of bells except to add to their uses, few former uses being abandoned as there seems to be no substitute for the tinkle of a bell, and the visible signal needs the audible to call attention. Relatively few bells are scrapped as they endure.

Electric Bells

THIS is the thirty-fifth of a series of articles dealing with some of the obscure uses of steel which go far toward absorbing the great American tonnage.

The first article on "corsets" appeared Nov. 22, 1923. Other articles appearing fortnightly since are:

Pins	*Razor Blades*
Cotton Ties	*Pens*
Toys	*Steel Wool*
Spinning Rings	*License Plates*
Card Clothing	*Hypodermic Needles*
Tie Plate	*Shoe Steel*
Tacks	*Crushed Steel*
Knives and Forks	*Skates*
Surgical Instruments	*Phonograph Needles*
Fence Posts	*Needles*
Eyeglass Cases	*Golf Clubs*
Fishing Tackle	*Mechanical Pencils*
Dental Drills	*Burial Caskets*
Pocket Knives	*Telephones*
Rat Guards	*Radio Towers*
Snap Fasteners	*Brushes*
Paper Clips	

FORMING GONGS FOR ELECTRIC BELLS IN PUNCH PRESS

Editorials

Iron Market Lacks Incentive

MANY pig iron sellers have been encountering a decided disinclination to buy on the part of their customers. This amounts almost to an utter indifference by consumers, large and small. This is true, too, at the start of another quarter or at a time when ordinarily the majority of users is under cover and protected for all or part of the quarter's needs.

Some are at a loss to explain this situation; others point to the large stocks of pig iron available as the logical cause. They say that while the estimated stock of pig iron for the country is not abnormally large, yet in certain districts heavy individual tonnages are available on furnace yards. As an example, in the Pittsburgh district, one valley furnace has 65,000 to 70,000 tons; another has in excess of 75,000 tons, and a third located right in Pittsburgh has about 25,000 tons.

Consumers there apparently see no incentive to anticipate needs—they believe with these stocks pressing the market, prices are not likely to advance and may decline further.

Because some furnaces now are selling at or below costs, producers feel they must check the market in some way. They state they cannot allow prices to decline further. For this reason, during the next few weeks more furnaces are scheduled to become inactive. A few producers will blow out their stacks; several, expecting an early improvement in demand, plan to bank but the general objective appears to be to keep furnace stocks from growing. This may start the buying or it may serve as a further deterrent to buyers' interest.

Steel Houses and Tornadoes

WITH brick and frame structures falling like leaves before cyclonic disturbances such as swept southern Illinois and Indiana recently, it is to be wondered whether the steel houses being erected by the British offer a measure of protection. These houses were described in the March 19 issue of IRON TRADE REVIEW.

That any practical structure, above ground, made by man could stand up against the terrific whirling motion of a cyclone or tornado is doubtful, but a steel structure might resist the cutting tendency. A buckled plate might form a shield against the storm's fury and at the worst prove no more dangerous than flying stone, brick and timber. Ability to withstand the pressure an extra minute might suffice to tide over the peak of the storm.

Wind tunnels at the leading universities could well be used for experimental purposes. With a 7-room steel house costing $2200 and being capable of erection in 10 days in Britain, adaptation of the idea in the storm belts of the United States would be both a humanitarian and an economical step. Each house requiring about seven tons of steel, the steel industry could afford to lend its assistance.

St. Paul and Canal Competition

ONE of the reasons cited by the directors of the St. Paul railroad for the financial plight which made necessary the receivership was Panama canal competition in transcontinental trade. Undoubtedly the canal has been an increasingly galling thorn in the side of most transcontinental roads. The St. Paul however, with its huge topheavy bond debt, and its large premature expansion in the Puget Sound territory together with adverse conditions in the Northwest was in a vulnerable position.

Efforts to combat the canal competition have included rate reductions on transcontinental freight. In 1915 the agregate tonnage of freight passing through the canal was 4,803,422. In 1924 the total was 25,892,134 tons, a new record and a gain of 435 per cent in a decade. American ships are carrying 56 per cent of the canal traffic against 44 per cent in 1915.

The St. Paul receivership does not reflect generally critical condition for railroads. In January net earnings of Class 1 roads gained 28 per cent over the total for one year ago. All roads earned 4.71 per cent on the their property valuation but roads in the Northwest earned only 2.75 per cent reflecting the adverse conditions in that region. The receivership for the road really clears the air and should pave the way for a financial regeneration of the system.

Few Works Councils in Mills

ONLY 2 per cent of the works councils in the United States are found in iron and steel plants. Although the metal trades as a group have 210 of the total of 814, it is to be noted from the latest survey by the National Industrial Conference board, the number in iron and steel mills is limited to 17. And this is three less than were reported for such mills in 1919.

In the board's survey of 1919 no councils were reported for the railway equipment division, but in 1922, 83 were disclosed, and that number again was reported in 1924. It accounts for about 40 per cent of

the councils accredited to the metal trades. The explanation for such a large proportion probably is the proximity of trade union domination of the railroads, and a tendency toward seepage of unionism into adjacent bodies.

Iron Production Moves Westward

DURING 1924 eight states produced nearly 93 per cent of all the pig iron made in the United States, according to complete production statistics compiled by the American Iron and Steel institute. These statistics included both coke and charcoal iron. During the year Pennsylvania made 35.2 per cent of the total: Ohio 23.6 per cent; Illinois, 8.28 per cent; Indiana and Michigan, 10.6 per cent; Alabama, 8.88 per cent; and New York and New Jersey, 6.4 per cent. Over the past five years these proportions have held with little variation, but as compared with ten years ago, or 1914, several significant changes are noted. In 1914, Pennsylvania made 41.8 per cent of the total; Ohio, 22.7 per cent; Illinois, 7.9 per cent; Indiana and Michigan, 6.68 per cent; Alabama, 7.85 per cent; and New York and New Jersey, 6.7 per cent. In this 10-year period Pennsylvania has lost 6.6 per cent and New York and New Jersey 0.3 per cent. Ohio showed a gain of 0.9 per cent; Illinois, 0.38 per cent; Indiana and Michigan, 3.92 per cent, and Alabama, 1.03 per cent. This is another indication that the center of the iron and steel industry is moving westward.

Which Is More Efficient, Steel Corporation or Bethlehem?

By A. J. Hain

SOME features of the annual reports of the United States Steel Corp. and the Bethlehem Steel Corp., issued almost simultaneously have led holders of stock in the two corporations to compare operating efficiencies.

It is understood 1924 was a year unsatisfactory for estimating the effectiveness of labor, because it was necessary to limit production while labor forces were less disturbed. The Steel corporation in 1923 employed an average of 260,786 workers and produced 14,721,469 tons of finished steel, while in 1924 its working force averaged 246,753, and its finished steel output was 11,722,908. The number of employes was reduced only 5.4 per cent, while the finished steel output was restricted 20 per cent.

Obviously, the method of dividing tonnage figures by number of employes to determine per capita output would lead to erroneous conclusions. On such basis, it might be inferred labor efficiency in 1924 went way below that of 1923; while the fact was the desire of the two corporations to afford continuous work for the greatest number of its employes accounts for the lesser record.

A stockholder in the two corporations has sought to get at the matter in a different manner, and has made comparisons between their production and employment figures. The Steel corporation's output of ingots in 1924 was 16,478,857 tons, and that of the Bethlehem corporation 4,419,037 tons. Bethlehem's output is 26.8 per cent of the Steel corporation's.

The Steel corporation's production of finished steel was 11,722,908 tons, compared with Bethlehem's 3,266,245 tons. The latter is 27.9 per cent of the former.

The ratio of ingots to finished products is substantially the same for the two interests; 71.6 per cent in the Steel corporation's case, and 73.5 per cent for Bethlehem.

The average number of employes of the Steel corporation, as stated, was 246,753; and the average of the Bethlehem corporation was 57,049. Bethlehem employed 23.1 per cent as many men as the Steel corporation in 1924.

A simple division of the number of tons of finished steel products by the number of employes shows that the Steel corporation's output was 47.5 tons per man; while that of the Bethlehem corporation was 57.2 tons. On this basis, one stockholder concludes that Bethlehem's labor efficiency was greater than that of the Steel corporation.

The comparison of the ratio of ingots to finished products is accurate; but the difficulty of extending the comparison beyond that point is evident when the Steel corporation's activities in iron ore mining, cement manufacture, railroad and vessel transportation are considered.

For instance, 24,264 of the Steel corporation's employes are accounted for in the operation of its transportation properties; 26,054 in its coal and coke production; 15,022 in mining iron ore, and 4334 in miscellaneous operations. In its manufacturing branches, 177,078 men were employed. The Bethlehem report does not give a similar classification of the various employes.

The Steel corporation's figures include all its employes. The Bethlehem report gives only the total for its operations in the United States. In the mining of iron ore in the Lake Superior district its association with other companies provides much of the tonnage it desires. The number of men thus engaged, of course, is not included in its report. The same is true when it comes to the transportation of the ore on the Great Lakes. When the ore is hauled to its furnaces it is over other lines. In contrast, the Steel corporation mines its own ore, ships it by lake and by rail in its own vessels and cars, and similarly provides its fuel. these operations accounting for 65,340 of its employes.

The Steel corporation's gross receipts as shown by its report amounted to $1,263,711,468, compared with $243,904,265 gross receipts reported by the Bethlehem corporation. The percentage relationship the Bethlehem gross receipts bear to the Steel corporation's is 19.3 per cent.

The Steel corporation's net earnings were $161,183,467 compared with Bethlehem's net income of $8,916,181. Bethlehem's percentage in this item is 5.5 per cent of the Steel corporation's. In other words, Bethlehem's gross receipts were about one-fifth of the Steel corporation's while its net earnings were a little more than one-twentieth those of the Steel corporation.

The conclusion reached by a stockholder is neither partial to nor derogatory to either one of the corporations. It merely accounts for the discrepancy appearing when finished steel output and man power are placed opposite one another on the scales, and the result for each corporation compared. Every factor must be weighed.

The Reader's Page

Vol. LXXVI, No. 14 IRON TRADE REVIEW April 2, 1925

Making Carbon Bolts with Alloy Properties

SO MUCH is said and written of the properties of heat treated alloy steel that comparatively little attention is paid to the effect of heating and quenching low-carbon steel. It remained for Roy H. Smith, while seeking to increase the strength of bolt and rivet steel, to find that steel having 0.15 per cent or less carbon shows remarkable properties when subjected to controlled and drastic quenching at the proper temperature. Bolt steel having a tensile strength of about 60,000 pounds per square inch when quenched by ordinary methods can be made to show a strength of 160,000 pounds when quenched suddenly. Mr. Smith not only demonstrated this in laboratory tests, but is treating bolts on a production basis every day by this method. The manner in which this unusual principle was first demonstrated and then successfully applied in practice is described in an illustrated article on page 71 of this issue. It deals with a significant development in the bolt industry.

What Users Want in Machines.
See Page 878.

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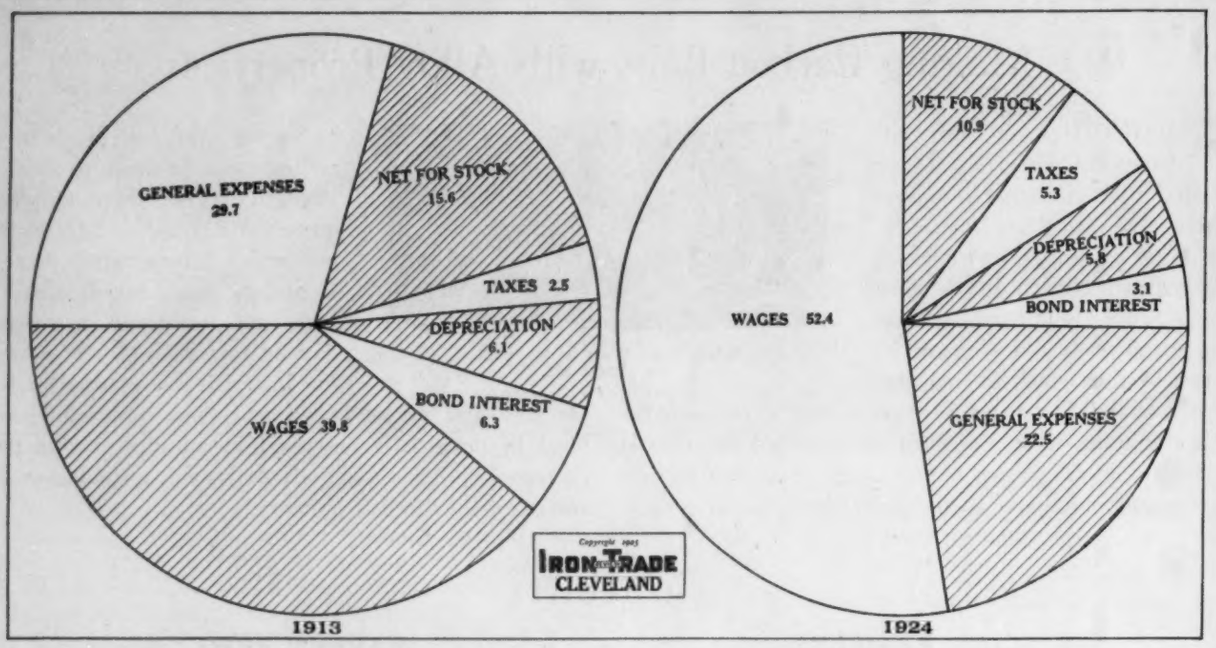
The Business Trend



How U. S. Steel Corp. Dollar Is Divided

BY JOHN W. HILL, Financial Editor

MORE and more of the United States Steel Corporation's dollar is going to labor and less of it to stockholders with the passing years. Of each dollar of gross returned from shipments of the corporation's products, wages absorbed 39.8 cents in 1913 and 52.4 cents in 1924. The net available for preferred and common stocks in the prewar year was 15.6 cents while last year it was only 10.9 cents.

THE gain in the proportion of gross going to labor in 1924 compared with 1913 was 31 per cent. The shrinkage in the slice of the gross dollar for capital was 30 per cent. These facts are disclosed by a study of the annual report of the corporation for 1924, as compared with former years. The diagram shows how the dollar was divided in 1924 and 1913.

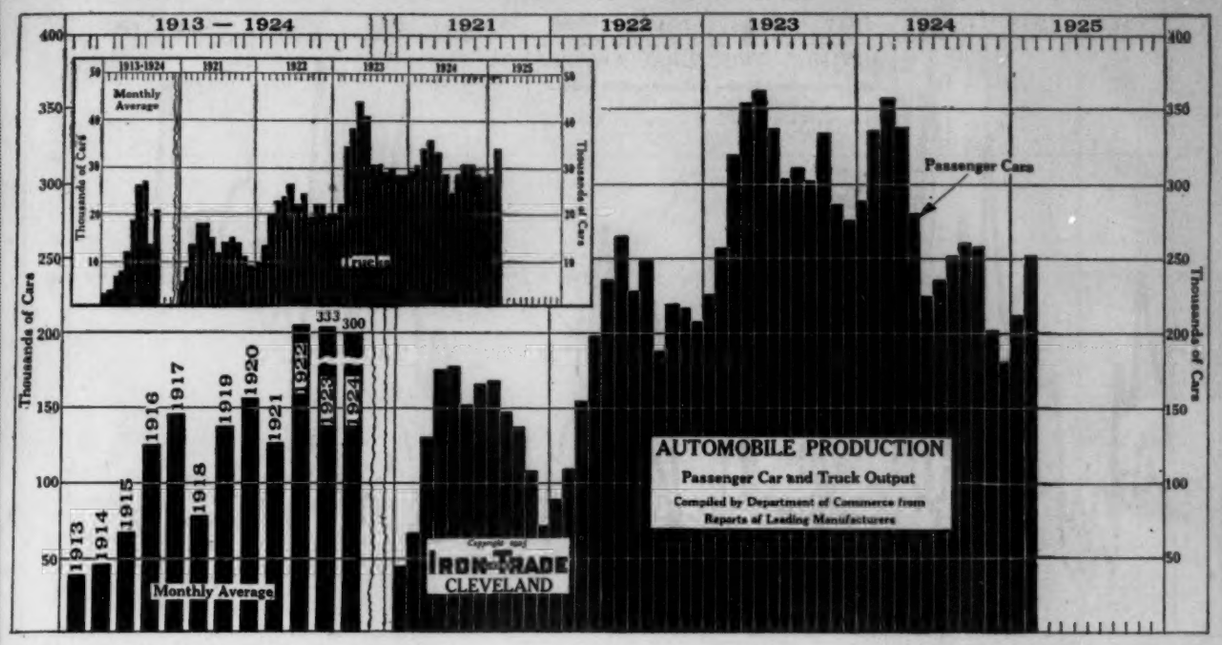
IN 1924 the gross value of business covering all shipments of iron and steel products, cement, cars, and other business not measured in ton units, was $842,969,442 a loss of 15 per cent from the 1923 total. The total outlay for wages during the year was $442,458,577 a decline of only 5.8 per cent from the aggregate for 1923. In 1913 gross sales of the company's products totaled $518,999,605 and the wages were $207,206,000.

AS POINTED out by Chairman E. H. Gary the 1924 net income represented an inadequate return on the value of investment employed. A huge capital fund is required in the iron and steel industry. Roughly estimated almost two years are required for a complete turnover. In order to earn a reasonable return of 10 per cent on investment the share of the corporation's dollar falling to capital each year ought to average around 20 per cent. It has averaged little more than 8 per cent since the war.

WITH the exception of the smaller proportion of gross going for general expenses the only other item showing an important decline from 1913 is that of bond interest. This is due to the corporation's policy of reducing its bonded indebtedness. In 1913 the bonds outstanding totaled $627,366,681 and on Dec. 31, 1924 they totaled $511,272,929 a reduction of $116,093,752. From April 1, 1901 to the end of 1924 the amount of bands and mortgages paid and retired was $261,745,747.

THE tax collectors, state and federal, are taking twice as much of the corporation's dollar as in the prewar days. In 1913, the first year of the federal income tax, the company paid $13,225,882 in taxes or 2.5 per cent of gross sales of products. In 1924 it paid $45,276,854 or 5.3 per cent of gross. The tax amounted to about 20 per cent of total net earnings in 1924. In the war year of 1918 the corporation was taxed 24 per cent of its gross sales and the tax paid of $274,000,000 in that year was 31 per cent greater than total net earnings after taxes.

The Business Trend

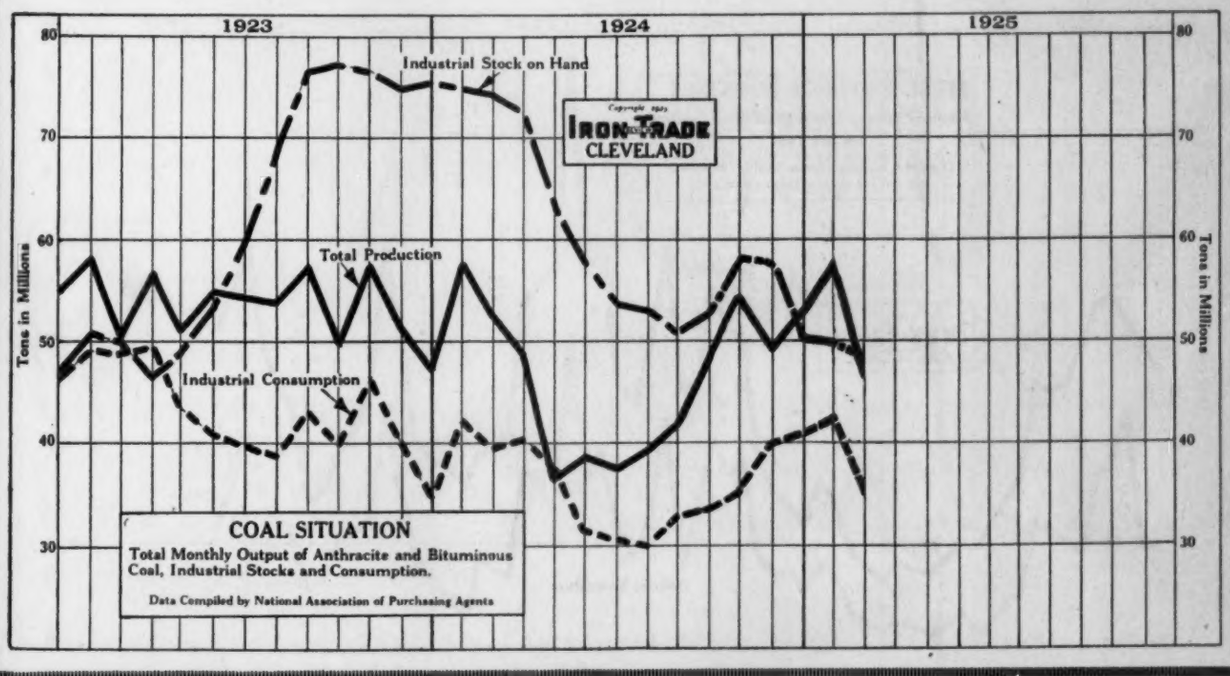


Automobile Production

THE automobile industry has experienced marked improvement since the first weeks of the year. The early appearence of favorable weather, and the policy of manufacturers to balbalance outputs by shipments, are bearing satisfactory fruit. The demand from consumers is increasing seasonably. Since there has been no overproduction of cars, as one year ago, outputs are gaining. The production in February was 276,000 cars and trucks by American companies both in this country and in Canada. The increase over January was 18 per cent.

Coal Situation

THE production of coal has declined recently but the consumption of it has dropped off also, so that stocks have been very little reduced as yet. The bituminous coal industry remains in the doldrums with only occasional signs of life in some districts. Prices are markedly weak. The output of soft coal in February dropped 13,000,000 tons to 38,963,000 net tons, Consumption of coal in industry in February was 35,227,000 net tons a decrease of 6,908,000 tons compared with January. Stocks are estimated at 48,766,000 tons.



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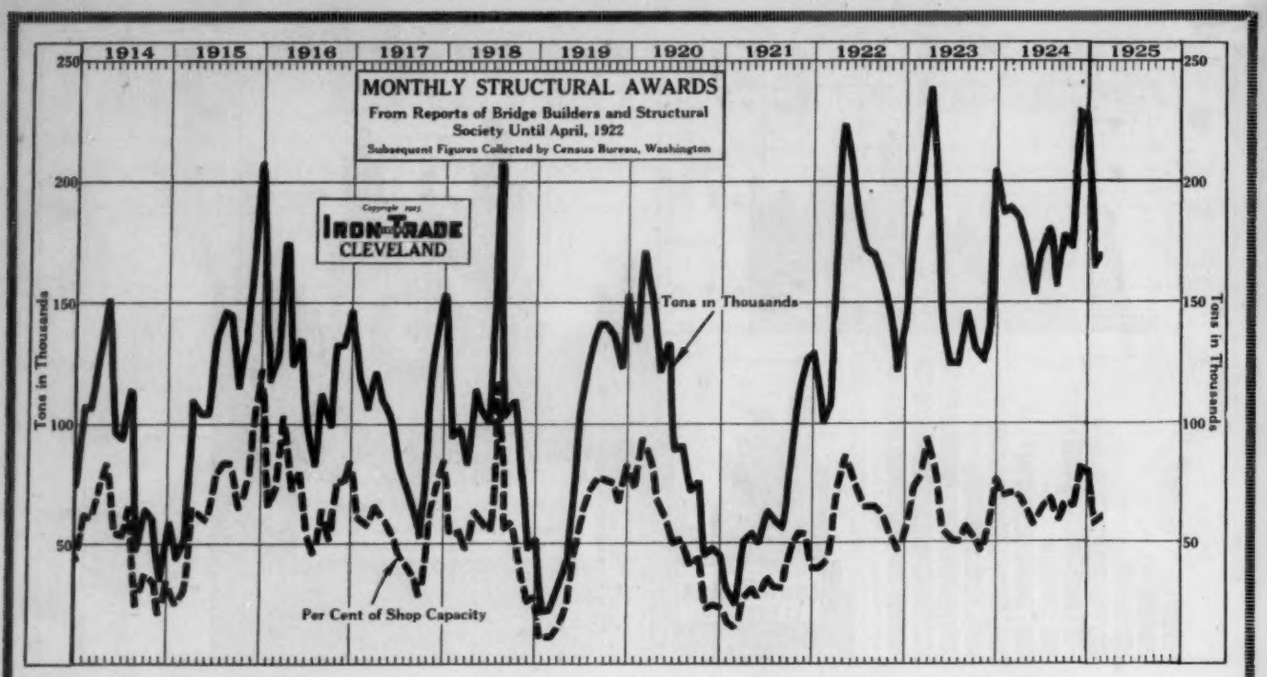
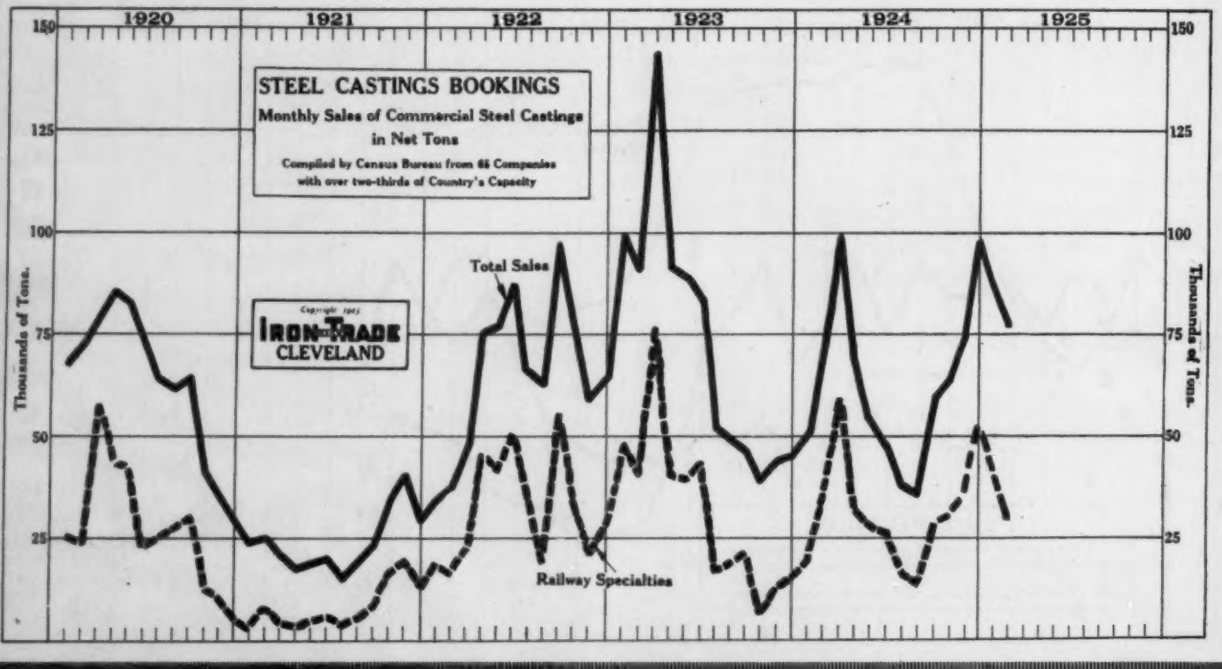

MONTHLY STRUCTURAL AWARDS
From Reports of Bridge Builders and Structural Society Until April, 1922
Subsequent Figures Collected by Census Bureau, Washington
IRON TRADE CLEVELAND
Tons in Thousands
Per Cent of Shop Capacity
1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925
250 200 150 100 50

Structural Awards

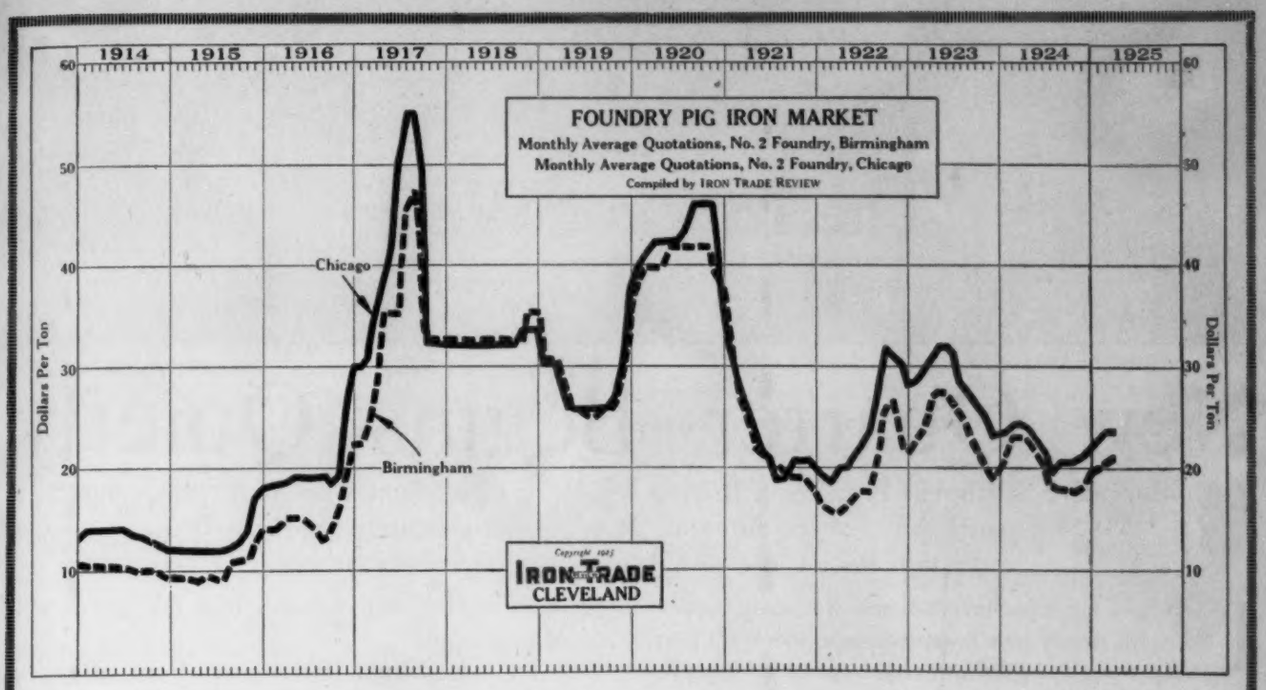
THE stimulus of spring is causing a decided increase in activities in the construction industry. This is reflected in the lettings of structural contracts. In February bookings of shapes in the country, computed from returns to the department of commerce, amounted to 171,100 tons. This compared with 165,300 tons in January. Awards were 59 per cent of shop capacity against 57 per cent one month before and 73 per cent one year ago. Shipments of 185,600 tons in February show a substantial excess over the tonnage of bookings.

Steel Castings

BOOKINGS of steel castings in February declined to 73,964 tons as compared with 82,922 tons in January. The February total, however, was exceeded only three times in 1924. The decline was due to reduced buying by the railroads. Bookings of railway specialities amounted to 27,237 tons against 40,799 tons in the preceding month. This was the smallest total for this class of orders since last August. It compares with 35,474 tons one year before. Miscellaneous bookings of 46,727 tons were the largest since May 1923.


STEEL CASTINGS BOOKINGS
Monthly Sales of Commercial Steel Castings in Net Tons
Compiled by Census Bureau from 66 Companies with over two-thirds of Country's Capacity
IRON TRADE CLEVELAND
Total Sales
Railway Specialties
Thousands of Tons.
1920 1921 1922 1923 1924 1925
150 125 100 75 50 25

The Business Trend

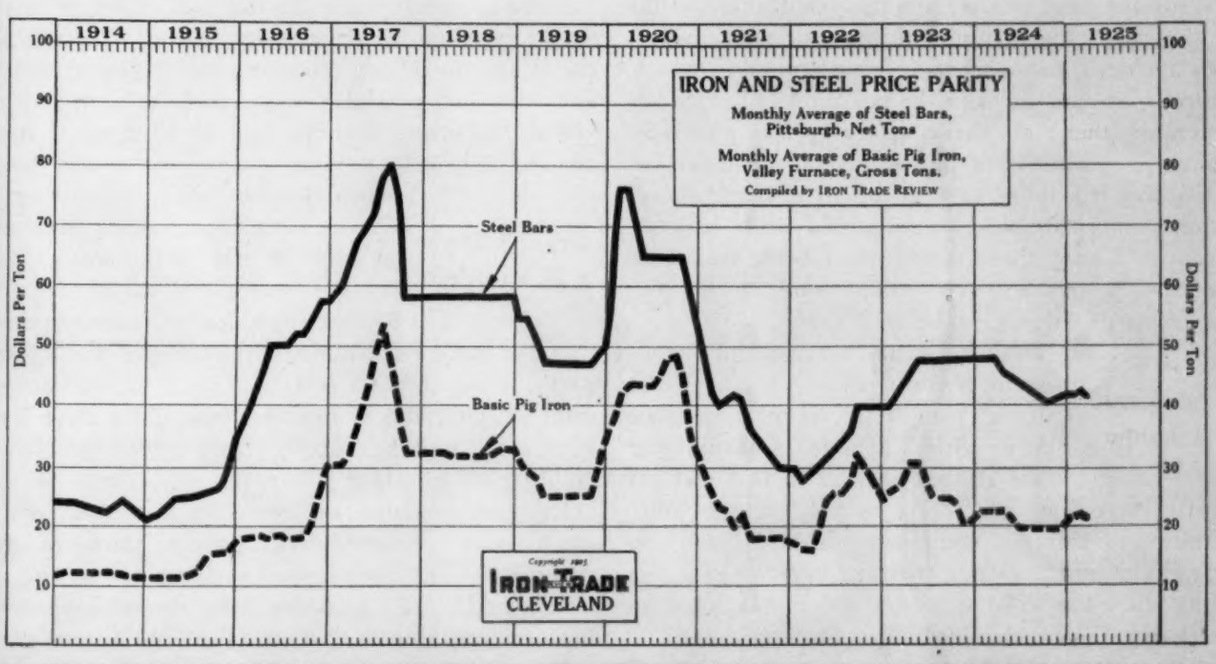


Foundry Pig Iron

THE prices of foundry pig iron have held fairly steady since the first of the year. In January, Chicago No. 2 iron averaged $23.80 a ton. It rose slightly to $24 a ton in February and clung to the same level in March. Southern foundry iron was 20 a ton in January. It advanced to $20.75 for the average in February and in March it held at $21. The spread between Chicago and Birmingham iron is now $3 a ton. It was only $1.50 a ton one year ago. The normal prewar spread between Northern and Southern iron was about $4.00.

Steel Price Parity

PRICES of both finished steel and of basic pig iron are softer. The average of steel bars, Pittsburgh, was $42 a ton. The quotation was advanced to $43 a ton for the February average, but March brought the level back to $42. Basic pig iron, valley furnace, now stands at the lowest level of the year, at $21 a ton. The January average was $21.80, that for February was $22, while March average was about $21.50. Bars are holding at about double the basic iron prices, which was a normal spread between these products before the war.



New Quarter Begins Quietly

Conservative Sentiment Prevails in Buying but Basic Conditions Appear Little Changed —Shipments Are Large—Advance Reports Show March Pig Iron Production Rate Close to February—Foreign Pipe Active

IRON and steel producers begin the second quarter with much less tonnage under contract than three months ago but with operations equally as good. The large backlogs against first quarter requirements taken on in November and December at tempting prices for the buyer, have been worked off or specified. The rate at which buyers have taken out their first quarter commitments has been surprisingly heavy, as measured by production and shipments. It is estimated that probably 85 to 90 per cent of this original contract tonnage has been converted into mill orders. Despite some moderate recessions, March has seen this flow of tonnage from producer to consumer or distributor kept up to a high level. Some large companies shipped more tonnage in March than any month in their history and the Chicago district as a whole, established a new maximum record.

With the first quarter tonnage substantially out of the road, the attitude of buyers has considerably changed from what it was around Jan. 1. There is no spur through the possibility of price advances as then; on the contrary, prices generally are easy. Enthusiasm has waned as business development has failed to keep up to brilliant expectations and prospects are regarded with less assurance. Under these conditions buying continues exceedingly conservative. Hand-to-mouth supplying of needs largely is being followed.

No Basic Change

Despite some reversal of sentiment, there is nothing to show that basic conditions have undergone any vital change. Consumption has slipped back in some directions but is increasing in others, notably in the automotive and farming equipment fields. There are no signs of stocks of raw material or finished goods piling up. The coke situation which has been an unsettling factor seemingly has been adjusted.

With about 1,000,000 tons of inquiry pending in the open market, the season's iron ore prices still are undetermined.

Output Is Holding Up

Slight differences from week to week still are the rule in operations. The March record of production has followed closely that of February according to preliminary reports of pig iron output for that month from leading steel companies representing about three-fourths of total capacity. On this basis, it is indicated the March output of pig iron was about 3,590,000 tons or 115,700 tons daily average against 3,214,067 tons total and 114,788 tons daily average in February. More than 10 furnaces dropped out.

On the steelworks side, the same general picture is shown. Chicago keeps to 100 per cent, the Pittsburgh district to about 85 to 88 per cent and the Mahoning valley to about 70 per cent.

Finished steel prices having lost some of their recent nominal advance, seem to be steadier. In the West, the $2 per ton additional asked on sheets and wire products has evaporated, as it had previously in other districts, and at Chicago it may also be dropped soon on plates, shapes and bars.

French Pipe Is Factor

Sharp foreign competition again has been conspicuous this week especially in cast iron pipe. On 12,500 tons for Oneida, N. Y., French pipe, for the second time, was low, on this occasion by $1.03 per ton. Similarly, it was low on 6000 tons of a 12,000-ton letting for Detroit. It now appears likely that Belgian steel will be supplied for a 4600-ton office building at Houston, Tex.

Pig iron remains neglected in a tonnage way, small sales predominating. Prices show further weakness. The valley market looks lower and at Chicago $23, a $1 drop, has been done. Tennessee furnaces continue to quote $18.50, Birmingham.

Except in pig iron, government figures as yet

do not reveal any exceptional gain in receipts of foreign iron and steel in February. Total imports were 92,380 tons of which 47,803 tons was pig iron from India, Germany, Great Britain and Holland. Exports were 102,302 tons.

Further sales of sheet bars have been made at $37, Youngstown and Pittsburgh, and on billets and slabs $36.50, Youngstown and Cleveland, has been named. A Cleveland seller has disposed of virtually all its second quarter production of semi-finished steel, about 90,000 tons.

IRON TRADE REVIEW composite of 14 leading iron and steel products nets a small loss of from $40.33 to $40.22, the smallest decline in four weeks.

Prices, Present and Past

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Apr. 1, 1925	Mar. 1925	Jan. 1925	April 1924
PIG IRON				
Bessemer, valley, del., Pittsburgh	$23.76	23.86	24.56	24.61
Basic, valley	21.00	21.35	21.80	21.70
Basic, eastern del., eastern Pa.	23.75	23.75	24.25	21.35
*No. 2 foundry, del. Pittsburgh	22.76	22.86	23.91	23.51
No. 2 foundry, Chicago	23.50	24.00	23.80	24.40
*Southern, No. 2, Birminghma.	20.00	21.00	20.00	22.20
*Southern Ohio, No. 2, Ironton	21.00	21.60	22.00	23.00
**No. 2X, Virginia furnace	24.50	24.00	24.50	25.50
**No. 2X, eastern, del. Phila.	24.01	24.51	25.61	23.73
Malleable, valley	21.00	21.25	22.20	22.20
Malleable, Chicago	23.50	24.00	23.80	24.40
Lake Superior charcoal, Chicago	29.04	29.04	29.04	29.04
Gray forge, val., del. Pittsburgh	22.26	23.36	23.66	23.51
Ferromanganese, del., Pittsburgh	119.79	119.79	119.79	112.29
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville furnace, ovens	3.10	3.35	4.10	3.55
Connellsville foundry, ovens	3.75	3.85	5.10	4.60
SEMIFINISHED MATERIAL				
Sheet bars, bessemer, Pittsburgh	37.00	38.50	39.20	42.10
Sheet bars, open-hearth, Pittsburgh	37.00	38.50	39.20	42.10
Billets, bessemer, Pittsburgh	37.00	37.75	37.40	40.00
Billets, open-hearth, Pittsburgh	37.00	37.75	37.80	40.00
FINISHED MATERIAL				
Steel bars, Pittsburgh	2.10	2.10	2.10	2.30
Steel bars, Chicago	2.20	2.20	2.10	2.40
Steel bars, Philadelphia	2.42	2.42	2.32	2.57
Iron bars, Philadelphia	2.28	2.28	2.28	2.47
Iron bars, Chicago mill	2.10	2.10	2.00	2.35
Beams, Pittsburgh	2.10	2.10	2.10	2.35
Beams, Philadelphia	2.32	2.32	2.32	2.57
Beams, Chicago	2.30	2.30	2.20	2.50
Tank plates, Pittsburgh	2.00	2.05	2.00	2.35
Tank plates, Philadelphia	2.32	2.37	2.32	2.52
Tank plates, Chicago	2.30	2.30	2.20	2.50
Sheets, black, No. 28, Pittsburgh	3.40	3.45	3.55	3.70
Sheets, blue anl., No. 10, Pittsburgh	2.60	2.65	2.70	2.80
Sheets, galvanized, No. 28, Pittsburgh	4.65	4.70	4.75	4.85
Sheets, black, No. 28, Chicago	3.75	3.75	3.75	4.10
Sheets, blue anl. No. 10, Chicago	2.75	2.85	2.85	3.35
Sheets, galvanized, No. 28, Chicago	4.75	4.90	4.90	5.20
Wire nails, Pittsburgh	2.85	2.85	2.85	3.00
Wire nails, Chicago	3.00	3.00	3.00	3.35
OLD MATERIAL				
Heavy melting steel, Pittsburgh	17.50	18.25	22.10	16.60
Heavy melting steel, eastern Pa.	16.00	16.25	20.00	15.35
Heavy melting steel, Chicago	15.75	16.70	19.45	14.65
No. 1 wrought, eastern Pa.	18.75	19.50	21.50	18.40
No. 1 wrought, Chicago	15.50	16.65	19.15	14.80
Rails for rolling, Chicago	17.00	18.15	20.95	17.10

Composite Market Average

The Fourteen Leading Iron and Steel Products Included are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (April 1, 1925)	$40.22
Last week (Mar. 25, 1925)	40.33
One month ago (March, 1925)	40.70
Three months ago (Jan., 1925)	41.02
One year ago (April, 1924)	42.33
Ten years ago (April, 1915)	42.66

Late News Flashes

Malleable Castings Output Drops

Washington, March 31.—February malleable castings output totaling 60,220 tons was slightly under that of January of 66,367 tons. Shipments totaled 60,561 tons compared with 59,138 tons in January. Operations and bookings fell in February.

Chicago Shipments Break Record

Chicago, March 31.—Heavy specifications, good transportation and favorable weather combined to break all records in March for monthly shipments of steel by Chicago mills. It is understood the shipments of the Illinois Steel Co. were the greatest of any month in the company's history. The Interstate Iron & Steel Co. broke all monthly records in its deliveries of wire and alloy steel.

Dismantling Coal Mines

Pittsburgh, March 31.—Dismantling of 16 of 54 coal mines of the Pittsburgh Coal Co., was completed March 26, closing the program of retrenchment started in January, 1924, due to high costs of production under the union scale. These 16 mines are valued at $5,000,000, and produced 3,000,000 tons of coal annually.

World's Steel Record Claimed

Pittsburgh, March 31.—What is claimed to be a new world's record for the production of open-hearth steel was made during March at the Weirton plant of the Weirton Steel Co., Weirton, W. Va. Without changing normal operating methods, 58,180 tons of basic ingots was produced which is equivalent to 8311 tons a furnace. Gas producer fuel was used exclusively.

Last Republic Iron Mill Passes

Chicago, March 31.—The last of its one-time 20 odd bar iron plants has been disposed of by the Republic Iron & Steel Co. in the sale of the East Chicago mill to Briggs & Turivas, scrap brokers. This plant has a capacity of 75,000 tons of bars a year and has been operated at intervals. The Republic company will relinquish the mill after filling present contracts. Briggs & Turivas are undecided whether to operate or scrap the mill.

New Furnace Blown In

Chicago, March 31.—The blowing in of the new Youngstown Sheet & Tube Co. stack at Indiana Harbor increases the number of steelworks stack in this district to 35. The only inactive ones now are two small stacks of the Illinois Steel Co. at Joliet. Open-hearth capacity in this district is still being operated at capacity.

Current Rolled Steel Prices

PRICES, CENTS PER POUND, UNLESS OTHERWISE STATED

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS

4 x 4-inch and larger

Pittsburgh, open hearth	$36.50 to 37.00
Pittsburgh, besemer	36.50 to 37.00
Youngstown	36.50 to 37.00
Philadelphia	42.80 to 43.30
Chicago	38.00 to 40.00
Forging, Pittsburgh	42.50 to 43.00
Forging, Philadelphia	47.30 to 52.30

SHEET BARS

Pittsburgh and Youngstown	37.00

SLABS

Pittsburgh	36.50 to 37.00
Youngstown	36.50 to 37.00

WIRE RODS

¼-inch and finer

Pittsburgh	$48.00 to 50.00
Cleveland	48.00 to 50.00
Chicago	52.00 to 53.00

Standard extras, $2.50 per ton over ¼-inch; $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp, Pittsburgh	2.10c
Universal skelp, Pittsburgh	2.10c
Sheared skelp, Pittsburgh	2.10c

Structural Shapes

Pittsburgh	2.10c
Philadelphia	2.22c to 2.42c
New York	2.24c to 2.44c
Chicago	2.30c
Cleveland	2.29c
Birmingham	2.25c to 2.35c

Steel Plates

Pittsburgh	2.00c to 2.10c
Philadelphia	2.32c to 2.42c
New York	2.34c to 2.44c
Chicago	2.30c
Cleveland	2.29c
Birmingham	2.15c to 2.25c

Iron and Steel Bars

Pittsburgh, soft steel	2.10c
Pittsburgh, cold finishing	2.25c
Pittsburgh, forging quality	2.35c
Philadelphia, soft steel	2.42c
New York, soft steel	2.44c
Chicago, soft steel	2.20c
Cleveland, soft steel	2.29c
Birmingham, soft steel	2.25c to 2.35c
San Francisco, soft steel	2.60c
Pittsburgh, refined iron	3.00c to 4.50c
Pittsburgh, reinforcing billet	2.10c to 2.20c
Chicago, rail steel	2.00c to 2.10c
Mill, rail steel	1.90c to 2.00c
Philadelphia, common iron	2.32c
New York, common iron	4.34c
Chicago, common iron	2.10c

Hoops, Bands, Strips

Hoops, Pittsburgh, 6-inches and under	2.40c
Bands, Pittsburgh 6-inches and under	2.40c
Hot rolled strip steel, Pittsburgh stamping quality	2.20c to 2.40c
Hot rolled strip steel, Chicago	2.60c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base, Pittsburgh, Cleveland	4.00c to 4.15c

Chicago and Worcester, Mass. $3 per ton higher.

Cold Finished Steel

Cold finished steel bars, drawn or rolled Pittsburgh, Chicago, carloads	2.70c to 2.80c
Less carload	2.95c to 3.05c
Steel shafting, turned and polished Pittsburgh, Chicago	2.70c to 2.80c

Screw stock base Cleveland $1 higher; and Worcester $3 higher than Pittsburgh and Chicago.

Hot Rolled Alloy Steels

Pittsburgh base

S. A. E. Series—	
2300 (3½ per cent nickel)	4.75c to 5.00c
3100 (nickel chromium)	3.65c to 3.75c
6100 (Chrome vanadium)	4.50c to 4.75c
6100 (Chrome vanadium spring)	4.00c to 4.25c
9250 (Silico manganese spring)	3.50c to 3.60c

Billets—4 x 4 to 10 x 10, gross ton at net ton bar price; under 4 x 4 to 2½ x 2½-inch $5 higher. Chicago base $2 higher.

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-hearth rails, mill	43.00
Relaying rails, St. Louis	27.00 to 32.50
Relaying rails, Pittsburgh	27.00 to 30.00
Light rails, 25 to 45 mill	1.70c to 1.75c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.85c to 2.90c
Spikes, small railroad, 7/16-inch and smaller, Pittsburgh	3.10c to 3.20c
Spikes, Boat and Barge, Pitts	3.25c
Spikes, railroad, Chicago	3.00c
Track bolts, Pitts. standard	3.90c to 4.25c
Track bolts, Chicago	4.00c
Tie plates, Pittsburgh	2.35c to 2.50c
Tie plates, Chicago	2.45c

Wire Products

To Jobbers in Carloads

F.o.b. Cleveland and Pittsburgh base

Wire nails	2.85c
Galv'd nails, 1-inch and over	5.10c
Plain wire	2.60c
Annealed wire	2.75c
Galvanized wide No. 9 gage	3.20c
Barbed wire, painted	3.30c
Barbed wire, galvanized	3.55c
Polished staples	3.30c
Galvanized staples	3.55c
Coated nails, count keg	2.15c
Woven wire fencing (retailers) 12½ gage, 26-in. high 7 bars and 12-in. stays per 100 rods, f.o.b. Pittsburgh	$20.56 to 21.09

Joliet, DeKalb and Waukegan, Ill., $2 per ton over Cleveland-Pittsburgh base on products made there. Worcester, Mass., and Fairfield, Ala., $3 higher. Duluth $2 higher. Chicago delivered price $3 higher, Anderson, Ind., $1 higher.

Sheets

SHEET MILL BLACK

No. 28, Pittsburgh base	3.35c to 3.50c
No. 28, Philadelphia, delivered	3.67c to 3.82c
No. 28, Gary, Indiana Harbor	3.60c to 3.70c
No. 28 Chicago, delivered	3.65c to 3.75c

TIN MILL, BLACK

No. 28, Pittsburgh, base	3.50c to 3.60c
No. 28, Gary base	3.60c to 3.70c

GALVANIZED

No. 28, Pittsburgh, base	4.50c to 4.60c
No. 28, Philadelphia, delivered	4.92c to 5.07c
No. 28, Gary, Indiana Harbor	4.70c to 4.80c
No. 28, Chicago, delivered	4.75c to 4.85c

BLUE ANNEALED

No. 10, Pittsburgh base	2.60c to 2.70c
No. 10, Philadelphia, delivered	2.92c to 3.02c
No. 10, Gary, Indiana Harbor	2.70c to 2.80c
No. 10, Chicago, delivered	2.75c to 2.85c

AUTOMOBILE SHEETS

No. 22, Pittsburgh base	4.40c to 4.50c

Tin Plate

Prices per 100-pound box, Pittsburgh

Tin plate, coke base	$5.50

Gary, Ind. base 10 cents higher

Iron and Steel Pipe

Base Discounts Pittsburgh and Lorain, O. to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	62	50½
1 to 1½-inch, but iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less and $4 per ton higher. Chicago delivered 2½ points less and $5 per ton higher.

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional—f.o.b. Pittsburgh Mills

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3¼ to 3½-inch	46 off

Chain, Piling, Cut Nails

Chain, 1-in. proof coil, Pitts.	6.15c to 6.25c
Sheet piling base, Pittsburgh	2.15c to 2.25c
Cut nails, f.o.b. mills	2.90c

Cast Iron Water Pipe

Prices per net ton

Class B Pipe

Four-inch, Chicago	50.70 to 52.20
Six-inch and over, Chicago	46.70 to 48.20
Four-inch, Birmingham	44.00 to 44.50
Six-inch and over Birmingham	40.00 to 40.50
Four-inch, New York	58.50 to 59.60
Six-inch and over, New York	53.50 to 54.60
Standard fittings, Birmingham, base	$110.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $5 higher than Class B.

Nuts and Bolts

F.o.b. basing points, Pittsburgh, Cleveland and Chicago.

Hot pressed square tapped or blank	$4.00 off list
Hot pressed hexagon tapped or blank	$4.40 off list
Cold punched square or hexagon blank	$4.10 off list
Cold punched square or hexagon tapped or blank	$4.10 off list
Cold punched U. S. S. semifinished hexagon nuts ⅝-inch and larger	75, 10 and 5 off
Cold punched U. S. S. semifinished hexagon nuts 9/16-inch and smaller	80, 10 and 5 off
Cold finished S. A. E. semifinished ⅝-inch and larger	75, 10, 10 and 5 off
Cold finished S. A. E. semifinished 9/16-inch and smaller	80, 10, 10 and 5 off

CARRIAGE BOLTS

(⅜ x 6", smaller and shorter)

Rolled thread	50, 10 and 5*
Rolled thread	50, 10 and 10 off
Cut thread (all sizes)	50 and 10 off
Eagle carriage bolts (Eagle list)	65 and 10 off

MACHINE BOLTS

(⅜ x 4", hot pressed nuts)

Rolled thread	50, 10 and 5*
Rolled thread	60 and 10 off
Cut thread (all sizes)	50, 10 and 10 off

(All sizes cold punched nuts)

Cut thread	45, 10 and 5 off
Lag screws	60, 10 and 10 off
Plow bolts Nos. 1, 2 and 3 heads	50 and 10 off
4 to 10 heads	50-10 + 20 off
*Flat and round head stove bolts	80 and 5 off
Tap bolts	30 off
Bolt ends with hot pressed nuts	50, 10 and 10 off
Bolt ends with cold punched nuts	45, 10 and 5 off
Blank bolts	50, 10 and 10 off
Rough stud bolts with nuts (250 pieces or more of a size)	40 and 10 off

*Price quoted on small business.

SEMIFINISHED CASTELLATED AND SLOTTED NUTS

Per 1000, f.o.b. producer's plant, freight allowed

	S. A. E. Castellated	U. S. S. Slotted
¼	$ 4.40	$ 4.40
5/16	5.15	5.15
⅜	6.20	6.60
7/16	7.90	9.00
½	10.10	10.50
9/16	13.80	14.20
⅝	17.00	17.30
¾	23.50	24.00
⅞	36.00	36.00
1	55.50	58.00
1⅛	89.00	89.00
1¼	126.00	131.00
1⅜	183.50	183.50
1½	210.00	210.00

Larger sizes—Prices on application

HEXAGON CAP SCREWS

Milled	80, 10, and 5 off
Upset	80, 10, 10 and 5 off

SQUARE HEAD SET SCREWS

Milled	80 and 10 off
Upset	80, 10 and 10 off

Rivets

Structural rivets, carloads Pittsburgh and Cleveland	2.50c to 2.60c
Structural rivets, carloads, Chicago	2.75c
Rivets, 7/16-in. and smaller Pittsburgh and Cleveland	70, 10 and 5 off
Rivets, 7/16-in. and small Chicago*	70, 10 off

*Some makers quoting 70 off with freight allowed on 300 pounds or more.

Washers

Wrought, c. l., Chicago dist.	$6.20 off
Wrought, c. l., Pitts. dist.	$6.00 to $6.10 off
Lock washers f.o.b. factory	85 and 10 off

Pig Iron

Buyers Holding Back in Anticipation of Lower Prices—Chicago Market Off $1—Some Bright Spots Noted

BUSINESS in the pig iron market has shrunk perceptibly during the past week, the volume of orders variously reported being at the lowest point in some weeks. It is believed the situation in the Pittsburgh district again is shaping up for a further decline in prices. Buyers are holding out for $20, base, on foundry iron, against producers' quotation of $21. Tonnage inquiry probably would develop a price concession of 50 cents on foundry, basic and bessemer grades. Shipping instructions are reported held in abeyance. In the Chicago territory the first pronounced decline in weeks is noted in sales at $23, base, Chicago, in contrast with the preceding general level of $24. The general market has some bright spots, in that the melt is increasing and certain furnaces report shipments going forward in unabated volume.

PITTSBURGH, March 31.—Pig iron practically is unmarked by large inquiry, small transactions dominating market activity. The Titusville Iron Works is inquiring for 500 tons of No. 3 and a similar tonnage of No. 2X. The Union Radiator Co., Johnstown, Pa., still is negotiating for 1500 tons, including 1000 tons of No. 2 plain. Buyers want $20, valley, for the base grade of foundry iron and are conducting something like a buyers' strike to get it. Producers are unwilling to go that low, but they may meet on middle ground. The next tonnage sales of foundry, basic and bessemer iron undoubtedly will develop lower prices by at least 50 cents. Merchant producers hold basic at $21, valley, in the absence of inquiries. Scattered sales of single carloads of bessemer iron at $22, valley, are noted. At least one producer will go to $21.50 on tonnage. One sale of 300 tons of malleable is noted at $21, valley. Other single carloads brought the same figure. Low phosphorus is unchanged at $29. More customers are holding back shipping instructions this week than last, on all grades.

Boston, March 31.—The first market test in many weeks was furnished recently by the sale of 2000 tons of No. 1X (2.75 to 3.25 silicon) to a Massachusetts consumer at $21.50, Buffalo, or $26.41 delivered. General market conditions remain quiet. Inquiry from Connecticut totals between 500 and 1000 tons. Eastern Pennsylvania furnaces have dropped to $23 base or $26.65 delivered.

New York, March 31.—The Gilbert & Barker Mfg. Co., Springfield, Mass. bought 2000 tons of No. 1X iron at $21.50, Buffalo. Otherwise the market is not fully tested, but is weak. While many consumers recently inquired, most of them are holding off. Eastern Pennsylvania foundry is nominally $22 to $23, base furnace.

Philadelphia, March 31.—A Bridgeton, N. J. consumer who bought foreign foundry iron recently at low prices was able last week to buy about 1500 tons of eastern Pennsylvania No. 2 plain at $22, furnace. This is 50 cents to $1 below the previous market. Prior to this business, substantial tonnage had been entered mostly at $22.75 to $23, base furnace. Buying at $22 resulted in a confused situation.

Buffalo, March 31.—Pig iron inquiry has increased to 6000 to 7500 tons. The Gould Coupler Co.'s inquiry for 2000 tons of basic and 2000 tons of malleable has not been placed as far as known here. The price tendency is slightly lower. Buffalo makers have a nominal minimum of $22 on No. 2 foundry and low silicon malleable, but it is thought large users have bought at 21.50. Basic is $21 to $21.50.

Cleveland, March 31.—Quiet conditions continue in the pig iron market. Some selling interests do not expect a buying movement before May. Sales closed by furnaces represented here amounted to 9000 tons for the week, not including specifications received on term contracts. Business transacted, and new inquiries totaling around 10,000 tons, show a slight improvement over the preceding week. Shipments in March were approximately the same as in February. Some interests report they shipped more than they made during the first quarter. Specifications for the second quarter received from one large consumer are in excess of its first quarter consumption; others are specifying about the same as for the first three months. New business is comprised of small lots, up to 1000 tons for early delivery. A Columbus melter placed 1000 tons. Cleveland furnaces continued to sell carlots at $22.50 to $23, furnace, for shipment in the 50-cent switching area, while for outside territory, a valley price of $21 is recognized. Lake furnaces are asking $22 to $22.50, furnace. No sales or inquiries involving basic iron figure in the week's business.

Chicago, March 31.—While small business in northern foundry and malleable continues to bring $24, base Chicago, it is reported 3000 tons of foundry iron was bought by a Milwaukee melter at $23, base. It also is understood the differential for silicon on part of this tonnage was 50 cents instead of $1. Some sellers believe the Chicago market now is quotable at $23 to $24 for No. 2 foundry and malleable. Selling continues extremely light, but the melt is not receding. Weakness in nearby districts and the South is having a sympathetic effect. Several inquiries are current for 300 to 500 tons of foundry iron. A Tennessee furnace is quoting $18.50, Birmingham. Tennessee furnaces have an advantage of only 12 cents a ton freight over Birmingham into Chicago.

Cincinnati, March 31.—Following a sale of 300 tons of southern iron to the Estate Stove Co., Hamilton, O., the market on southern iron dropped to $18.50, Birmingham, as quoted by Tennessee furnaces. Producers in the Birmingham district still quote $20. The market on northern iron ranges from $21 to $22.50 Ironton base. Recent sales of ferrosilicon and silvery irons have been made at $1 under schedules. The Louisville & Nashville railroad is reported to have bought 400 tons of southern and 105 tons of charcoal iron. The New York Central railroad is inquiring for 1600

Pig Iron Prices

Prices per gross ton

Bessemer, valley	$22.00
Bessemer, Pittsburgh	23.76
Basic, valley	21.00
Basic, Pittsburgh	22.76
Basic, Buffalo	21.00 to 21.50
Basic, del., eastern Pa.	23.50 to 24.00
Malleable, valley	21.00
Malleable, Pittsburgh	22.76
Malleable, Cleveland, del.	23.00 to 23.50
Malleable, Chicago	23.00 to 24.00
Malleable, Buffalo	21.00 to 21.50
Malleable, del., eastern Pa.	24.25 to 24.75
No. 1X, eastern del., Phila.	24.76 to 25.26
No. 1X, Buffalo	21.50 to 22.50
No. 1 foundry, Chicago	23.50 to 25.00
No. 2 foundry, valley	21.00
No. 2 foundry, Pittsburgh	22.76
No. 2 foundry, Buffalo	21.00 to 21.50
No. 2 foundry, Chicago	23.00 to 24.00
No. 2 foundry, Granite City	23.00 to 23.50
No. 2 foundry, Ironton fur.	21.00 to 22.50
No. 2 foundry, Cleveland, del.	23.00 to 23.50
No. 2 foundry, del., Phila.	23.26 to 23.76
No. 2 foundry, N. J., tidewater	23.39 to 24.39
No. 2X, eastern del, Phila.	23.36 to 24.26
No. 2X, east, N. J., tidewater	23.89 to 24.89
No. 2X, eastern del., Boston	27.65 to 28.15
No. 2X, foundry, Buffalo fur.	21.50 to 22.00
No. 2X, Buffalo, del., Boston	27.42 to 27.92
Continental foundry, Boston	23.50 to 24.00
No. 2 southern, Birmingham	18.50 to 21.00
No. 2 southern, Cincinnati	22.55 to 25.05
No. 2 southern, Philadelphia	26.31 to 28.81
No. 2 southern, Chicago	24.51 to 27.01
No. 2 southern, Cleveland	24.51 to 27.01
No. 2 southern Boston (rail and water	25.41 to 27.91
No. 2 southern, St. Louis	23.67 to 26.17
No. 2X, Virginia furnace	23.50 to 24.50
No. 2X, Virginia, Phila.	28.67 to 29.67
No. 2X, Virginia, Jersey City	29.04 to 30.04
No. 2X, Virginia, Boston	29.42 to 30.42
Gray forge, eastern Pa.	23.50 to 24.00
Gray forge, val. del. Pitts.	22.26
Low phos., standard, valley	29.00 to 29.50
Low phos., standard, Phila.	29.79
Low phos., Lebanon, furnace	26.00
Low phos., English, Phila.	26.76 to 27.26
Charcoal, Birmingham	30.00
Charcoal, Superior, Chicago	29.04

Silvery iron, Jackson county, Ohio, furnace, 7 to 8 per cent, $28.50 to $29.00; 8 to 9 per cent, $30.00 to $30.50; 9 to 10 per cent, $32.00 to $32.50; 10 to 11 per cent, $34.00 to $34.50; 11 to 12 per cent, $36.50 to $37.00; 12 per cent, $39.00 to $39.50.

Bessemer ferrosilicon, Jackson county, Ohio, furnace, 10 to 11 per cent, $39.50; 11 to 12 per cent, $42.00; 12 to 13 per cent, $44.50.

tons of iron, including 100 tons of silvery, for Elkhart, Ind., and Frankfort, N. Y. The American Elevator Co., Louisville, Ky., is in the market for several hundred tons of high silicon foundry. Preparations are being made to resume operations at the furnace of the Belfont Steel & Wire Co., Ironton, O., banked a month ago.

St. Louis, March 31.—The only inquiry pending for second quarter specifies 500 tons of foundry iron, for a St. Louis machine manufacturer. The market is extremely dull, and has been weakened by offerings from a Tennessee maker at $18.50, base Birmingham. The maker has sold several thousand tons. The reduction has not been met by other southern interests and Chicago and Granite City furnaces are nominally quoting their prices of a week ago. The St. Louis Coke & Iron Co., sold about 4000 tons for second quarter. A St. Louis steel maker bought 3000 tons of this.

Birmingham, Ala., March 30.—Southern furnaces are not selling any great amount of pig iron at their quoted price, $22. Reports are current that not only are the Tennessee furnaces selling down to $18.50 but that in this immediate district a small tonnage has been sold at less than $21. Local consumers say they are getting iron under the quoted price here. Furnace interests start the second quarter with considerable iron still due melters.

Ferroalloys

Ferrosilicon Sales Most Numerous—Ferromanganese Appears Less

Pittsburgh, March 31.—Inquiries and orders for lower grade ferrosilicon furnish the chief interest in the ferroalloys market. The Carnegie Steel Co. purchased 1000 tons of 10 per cent electrolytic ferrosilicon direct from the maker at less than $34, furnace. Other sellers quoted as high as $36. Another nearby buyer took 100 tons of blast furnace 11 per cent about 50 per cent under the quoted market through freight equilization. The Follansbee Bros. Co. closed for a carload of 10 per cent. No new sales of 50 per cent ferrosilicon are noted and the market remains $85 delivered Pittsburgh. Inquiries for ferromanganese are nil, except for one involving 1000 tons of English material monthly for the last half. The $115 seaboard and domestic furnace price remains firm. A carload of spiegeleisen, 16 to 19 per cent was sold last week at $32. The 19 to 21 per cent grade is unchanged at $33 in small lots. One contract for second quarter, 200 to 300 tons, was taken at $32.

New York, March 31.—New business in ferromanganese is restricted to small lots which are going at $115, duty paid tidewater. There are intimations, however, that large tonnages could be placed at less. Buyers are not interested; hence there is no test of the market's position. Small sales of spiegeleisen are being made at $33, furnace, for 20 per cent.

Indian ferromanganese, averaging around 75 per cent manganese, now is being offered at $104, duty paid tidewater.

Chicago, March 31.—Some resale ferromanganese has been offered in this territory below $115, seaboard, duty paid. Spiegeleisen is quiet and unchanged.

Ferroalloy Prices

†Ferromanganese 78 to 82 per cent, tidewater, or furnace first hand and resale	$115.00
Ferromanganese delivered Pittsburgh	119.79
Spiegeleisen 19 to 21 per cent domestic furnace or tidewater	32.00 to 33.00
Ferrosilicon, 50 per cent contract freight allowed	85.00
Ferrotungsten standard, cents per pound contained	96.50
Ferrochrome, 60 to 70 chromium, 6 to 8 carbon, cents per pound contained, delivered	11.50
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	3.25 to 3.75
Ferro-carbon-titanium, car lots, producer's plant, net ton	200.00

†Duty paid.

Coke

Connellsville Market Settles to Around $3.25 for Furnace Grade—Buyers Moving Slowly

CONCURRENT with wage and price adjustments, the Connellsville beehive coke market has settled to around $3.25 on extended contracts for the furnace grade. Minor labor troubles have been dispelled and operations are going forward satisfactorily. The market is somewhat more active, but the pig iron situation is exerting a depressing influence and some negotiations for coke have been deferred. In the New England district by-product foundry coke has been reduced 50 cents to $11.50 for April.

Pittsburgh, March 31.—Adjustments are the order of the day in the beehive coke industry. Workmen are adjusting themselves to new wage conditions, and minor difficulties now are practically over. Producers and consumers are adjusting themselves, with the market fairly firm. On extended shipments the price is $3.25. However, one user bought 6000 tons monthly at $3.20 and another purchased 100 carloads at $3.15. Several arrangements previously were made at higher figures. A local steel interest contracted for 40,000 tons at $3.30. Another nearby user paid $3.35. Two negotiations pending for some time are likely to fall through because it is doubtful if the furnaces will start. Spot sales are noted at $3.10 and $3.15. Inquiries from gas producers are increasing. One from Philadelphia specifies 110,000 tons for delivery over the year. Sales of medium sulphur coke are small, at $2.50 up. Foundry coke buying is withheld, purchasers wanting lower figures. One seller quoting $4.75 has taken on a little tonnage at $4.50. Spot sales as low as $3.75 are noted. Premium brands bring $5 to $5.25 and in box cars 25 cents higher.

Production of coke in the Connellsville region for the week ended March 21 was 174,990 tons, as compared with 176,600 tons the preceding week, according to the *Connellsville Courier*.

Boston, March 31.—The price of foundry coke in New England has been reduced to $11.50, delivered, for April. Specifications have improved.

New York, March 31.—By-product coke here continues $10.41, delivered to Newark and other northern New Jersey points. Spot beehive coke is $4 to $5, Connellsville.

Chicago, March 31.—Chicago producers are continuing a price of $10.75 on foundry coke for April, but it is reported here the St. Louis price has been reduced $1. This may affect the price here, although the report is unverified.

Cincinnati, March 31.—Demand for foundry coke continues dull and concessions are being offered. The Louisville & Nashville railroad bought 850 tons of Wise county foundry for second quarter. Trading in by-product is light. The Indianapolis and Terre Haute, Ind., makers will not alter their price schedules for April. Producers of Pocahontas coke have more fuel to offer than for several months, especially the foundry grade. While New River foundry ranges from $8 to $8.50, ovens, sales have been at $7.50.

St. Louis, March 31.—A fairly good business is being done in foundry coke by by-product producers in the district. Prices are unchanged.

Birmingham, Ala. March 30.—By-product foundry coke quotations are around $5. Some beehive coke is selling at $5.50 in small lots. All by-product plants are in full operation.

Coke Prices

Beehive, Ovens

Prices per net ton

Connellsville, furnace	$ 3.10 to 3.35
Connellsville foundry	3.75 to 4.75
Wise county furnace	3.75 to 4.25
Wise county foundry	4.50 to 5.25
Alabama furnace	4.00 to 4.50
Alabama foundry	5.00 to 5.50

By-Product

Foundry, Newark, N. J.; del.	$10.41
Foundry, Chicago, ovens	10.75
Foundry, New England, del.	12.00
Foundry, St. Louis	11.00
Foundry, Granite City, Ill.	9.00
Foundry, Birmingham	5.00 to 5.50

Plates

Market Is Dull, and Prices Show Easy Trend—2.00c, Pittsburgh, Lowest Developed on 2200 Tons

INQUIRIES and orders for plates have fallen off, and the market this week is devoid of important transactions. On an inquiry for 2200 tons of car repair plates issued by the Reading railroad the lowest price developed was 2.00c, Pittsburgh, and the company decided to buy small lots currently. It has awarded six car floats requiring 3500 tons of steel to a New York shipbuilder. Pittsburgh mills have received good specifications. Some rumor is heard of a reduction of $2 in the Chicago district, in line with current Pittsburgh quotations.

PLATE PRICES, PAGE 894

Chicago, March 31.—With Pittsburgh makers quoting at practically the equivalent of the Chicago price of 2.30c and operations of local makers becoming more irregular, it is generally believed that a $2 reduction impends. One maker has been taking a small amount of business at the full 2.30c price. The Standard Oil Co. of Indiana is reported planning to build 32 stills in its own shops at Whiting, Ind.; these would require about 1100 tons of plates. Freight car awards in the past week brought only 1500 tons of plates to one maker.

Boston, March 31.—Second quarter plate inquiry shows improvement. Prices are firm at 2.365c delivered, or 2.00c Pittsburgh, with previous rate of buying sustained.

Philadelphia, March 31.—The Reading railroad opened bids last week on 2200 tons of repair plates but decided not to buy because 2.00c, Pittsburgh, was the lowest quotation. Meantime it is buying currently. The Reading placed six car floats, involving 3500 tons of steel, with the New York Shipbuilding Co. The steel will be supplied by the Steel corporation. Operations of eastern mills average 50 per cent.

Pittsburgh, March 31.—Notwithstanding the falling off in plate inquiries, makers have fair backlogs. While specifications have been large and shipments heavy much tonnage remains to be delivered. The general price here is 2.10c, but 2.00c is being quoted for delivery into districts where such competition is met.

Cleveland, March 31.—Pittsburgh mills are expected to furnish about 5000 tons of plates to the Biggs Boiler Works Co., Akron, for a water line at Kansas City upon which the latter is low bidder. The contract for the work has not yet been placed with the Biggs company. Many boiler inquiries are pending but new work is being let conservatively. Talk of 2.00c Pittsburgh finds no verification here in ordinary market trading and 2.10c, Pittsburgh or 2.29c, Cleveland, is representative.

CONTRACTS PLACED

500 tons, tanks for General Petroleum Co. which will fabricate, plain material awarded an eastern mill.
130 tons, Pontoon pipe for United States Engineers, Portland, Oreg., placed with Coast Culvert & Flume Co. and Smith & Watson Iron Works.
660 tons, 60 and 66-inch pipe for Tacoma, Wash., to Williamette Iron & Steel Co.

CONTRACTS PENDING

550 to 1000 tons, pipe line for Vista Irrigation district, Vista, Calif., bids in April 3.
120 tons, pipe line for Seattle, Wash.; Steel Tank & Pipe Co. low bidder.
300 tons, three 30,000-barrel tanks for Pacific Gas & Electric Co., San Francisco; bids in April 3.
600 tons, two 80,000-barrel tanks for Associated Oil Co. at Ventura, Calif.; bids in.
350 to 4300 tons, pipe line for Vancouver, B. C.; bids in April 14.
1500 tons, pipe line at Minneapolis; pending.
1100 tons, 32 stills to be built by Standard Oil Co. at Whiting, Ind.; pending.

The annual report of Graton & Knight Mfg. Co., Worcester Mass., large producers of leather belts shows a net profit of $299,000 for 1924. Total sales for the year amounted to $7,291,470 against $8,930,004 for 1923.

Semifinished

More Sheet Bar Tonnage Closed at $37—Buyers More Interested —Cleveland Mill Full

FURTHER transactions have helped to establish the general market for sheet bars at $37, Pittsburgh, or Youngstown as reported in IRON TRADE REVIEW last week. This quotation has been put out by representative sellers on current inquiries, and additional business has been closed. Quotations of $36.50 to $37, valley, are noted on billets and slabs. Additional inquiry has been brought out by the lower figures, and buyers show more willingness to close for second quarter. A Cleveland producer is booked practically full for second quarter.

SEMIFINISHED STEEL PRICES, PAGE 894

Pittsburgh, March 31.—Semifinished material users in this territory have in large part signed up their second quarter contracts. Due to the action of Ohio mills in selling sheets bars at $37, Youngstown, conversion mills in this territory which closed at $39, Pittsburgh, want adjustments downward. So far this has not been done. The price on 4 x 4-inch rerolling billets here is $37.50, and two or three of the larger strip steel producers have signed their second quarter contracts. On small billets, the usual $1.50 differential is asked, and in connection with forging billets, while at least two makers are endeavoring to quote a $10 differential for guaranteed forging quality, under a new S. A. E. specification soon to come out, others still adhere to $5. Wire rod specifications are heavy. The price is $48 to $50. Skelp is unchanged at 2.10c. Specifications have been heavy for wheel skelp.

New York, March 31.—Severe price cutting has developed in connection with some of the second quarter billet contracts which have been placed in the eastern territory recently. In some instances standard open-hearth rerolling billets sold at prices equivalent to $33 to $34, base Pittsburgh. Forging billets sold at $40, base Pittsburgh.

Youngstown, O., March 31.—No official announcement has been made by producers of sheet bars here concerning prices for second quarter. Few contracts for second quarter sheet bars have been signed. Approximately 50 per cent of first quarter tonnage has not been specified. The trade expects the establishment of $37, Youngstown, on sheet bar tonnage for next quarter. Offers on this basis are outstanding.

Cleveland, March 31.—More interest has developed in the market for sheet bars since sales were made a week ago at $37, valley. The leading local producer quotes $37.50 on sheet bars, base Cleveland or Youngstown, depending on point of delivery and $36.50 on billets and slabs. This maker is practically out of the market for second quarter, approximately 100 per cent of its output being covered at trade paper quotations. It is operating at normal capacity. A Cleveland sheet mill in the market for a round tonnage of sheet bars finally closed on about 2000 tons of ingots with a Cleveland maker. The ingots will be converted to sheet bars. The Japanese inquiry for 10,000 tons of sheet bars recently circulated was withdrawn.

Enlarges Open Hearths

The Penn Seaboard Steel Corp. has under construction another 50-ton basic open-hearth furnace at its Newcastle, Del. plant which, when completed, will give a complement of two 50-ton basic and two 30-ton acid oil-fired steelmaking units. The new unit replaces two furnaces of 30-ton capacity each.

Iron and Steel Scrap Prices

Corrected to Tuesday Noon Gross Tons Delivered to Consumer

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	14.00 to 15.00
Boston (dealers)	11.00 to 12.00
Buffalo	16.75 to 17.25
Chicago	15.75 to 16.25
Cleveland	16.75 to 17.25
Cincinnati (dealers)	13.50 to 14.00
Detroit	14.75 to 15.25
Eastern Pennsylvania	15.50 to 16.50
New York (dealers)	11.50 to 12.00
Pittsburgh	17.50 to 18.00
St Louis	14.50 to 15.00
Valleys	18.25 to 18.50

COMPRESSED SHEETS

Buffalo	15.50 to 16.00
Chicago	13.50 to 14.00
Cleveland	14.00 to 14.25
Detroit	12.50 to 13.00
Pittsburgh	16.50 to 17.00
Valleys	nominal 16.50

BUNDLED SHEETS

Buffalo	12.50 to 13.00
Cincinnati (dealers)	10.00 to 10.50
Cleveland	11.75 to 12.00
Eastern Pennsylvania	13.00
Pittsburgh	15.50 to 16.00
St. Louis	9.50 to 10.00
Valleys	14.50 to 14.75

SHEET CLIPPINGS, LOOSE

Chicago	10.25 to 10.75
Detroit	10.00 to 10.50

STEEL RAILS, SHORT

Birmingham	14.00 to 15.00
Chicago	18.50 to 19.00
Cincinnati (dealers)	16.00 to 16.50
Cleveland (over 6 ft.)	15.50 to 16.00
Detroit	17.50 to 18.00
St. Louis	18.00 to 18.50

STOVE PLATE

Birmingham	14.50 to 15.00
Boston (consumers)	14.00 to 14.50
Buffalo	15.00 to 15.25
Chicago	15.25 to 15.75
Cincinnati (dealers)	10.00 to 10.50
Cleveland	13.75 to 14.00
Detroit (net tons)	12.50 to 13.00
Eastern Pennsylvania	13.50
New York (dealers)	9.50 to 10.00
Pittsburgh	14.50 to 15.00
St. Louis	14.00 to 14.50

LOW PHOSPHORUS

Buffalo	18.50 to 19.00
Cincinnati (dealers)	15.50 to 16.00
Eastern Pennsylvania	20.00 to 21.00
Pitts. billet and bloom crops	23.00 to 23.50

SHOVELING STEEL

Chicago	15.50 to 16.00
Pittsburgh	14.00 to 14.50
St. Louis	14.00 to 14.50

KNUCKLES, COUPLERS, SPRINGS

Chicago	18.00 to 18.50
Eastern Pennsylvania	18.00 to 19.00
Pittsburgh	20.00 to 20.50
St. Louis	18.00 to 18.50

FROGS, SWITCHES, GUARDS

Chicago	16.00 to 16.50
Eastern Pennsylvania	15.50 to 16.50
St. Louis	16.00 to 16.50

ANGLE BARS—STEEL

Buffalo	20.50 to 21.00
Chicago	17.00 to 17.50
St. Louis	16.50 to 17.00

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	13.00 to 14.00
Boston (dealers)	14.00 to 14.50
Buffalo, No. 1	14.00 to 14.50
Buffalo, No. 2	16.75 to 17.25
Chicago, No. 1	15.50 to 16.00
Chicago, No. 2	15.50 to 16.00
Cincinnati, No. 1 (dealers)	11.00 to 11.50
Cleveland, No. 1	12.00 to 12.50
Eastern Pennsylvania	18.50 to 19.00
New York, No. 1 (dealers)	16.00 to 17.00
Pittsburgh, No. 1	14.50 to 15.00
Pittsburgh, No. 2	17.50 to 18.00
St. Louis, No. 1	15.00 to 15.50
St. Louis, No. 2	14.00 to 14.50

WROUGHT PIPE

Boston (dealers)	11.00 to 11.50
Buffalo	14.00 to 14.50
Eastern Pennsylvania	16.00 to 16.50
New York (dealers)	11.25 to 11.75

YARD WROUGHT

Boston	12.00 to 13.00
Eastern Pennsylvania	17.00 to 18.00

BUSHELING

Buffalo	15.50 to 16.00
Chicago, No. 1	13.50 to 14.00
Chicago, No. 2	10.25 to 10.75
Cincinnati, No. 1 (dealers)	10.00 to 10.50
Cleveland, No. 1	14.25 to 14.50
Cleveland, No. 2	12.50 to 13.25
Eastern Pennsylvania	14.50 to 15.00
Pittsburgh, No. 1	15.50 to 16.00
St. Louis, No. 1	14.00 to 14.50

MACHINE SHOP TURNINGS

Birmingham	8.00 to 9.00
Boston (dealers)	8.00 to 8.50
Buffalo	11.50 to 12.00
Chicago	10.00 to 10.50
Cincinnati (dealers)	10.00 to 10.50
Cleveland	13.75 to 14.25
Detroit	11.00 to 11.50
Eastern Pennsylvania	13.00
New York (dealers)	9.00 to 9.50
Pittsburgh	14.00 to 14.50
St. Louis	9.00 to 9.50
Valleys	13.25 to 13.50

CAST IRON BORINGS

Birmingham (chemical)	15.00 to 16.00
Birmingham (plain)	8.00 to 9.00
Boston (chemical)	13.50 to 14.00
Boston (dealers)	8.00 to 8.50
Buffalo	12.00 to 12.50
Chicago	13.25 to 13.75
Cincinnati (dealers)	10.50 to 11.00
Cleveland	14.00 to 14.25
Detroit	11.00 to 11.50
Eastern Pennsylvania (chem.)	18.00 to 19.00
Eastern Pennsylvania	13.50 to 14.00
New York (dealers)	9.75 to 10.25
Pittsburgh	14.00 to 14.50
St. Louis	13.00 to 13.50
Valleys	13.50 to 14.00

MIXED BORINGS AND TURNINGS

For blast furnace use

Boston (dealers)	8.00 to 8.50
Cincinnati (dealers)	10.00 to 10.50
Cleveland	14.00 to 14.25
Detroit	11.00 to 11.50
Eastern Pennsylvania	12.50 to 13.00
New York (dealers)	9.25 to 9.75
Pittsburgh	14.00 to 14.50

PIPES AND FLUES

Chicago	12.50 to 13.00
Cincinnati (dealers)	8.50 to 9.00
Cleveland	10.00 to 10.50
St. Louis	11.00 to 11.50

RAILROAD GRATE BARS

Buffalo	13.50 to 14.00
Chicago	14.75 to 15.25
Cleveland	13.75 to 14.00
Eastern Pennsylvania	13.50
New York (dealers)	14.00 to 14.50
St. Louis	13.50 to 14.00

FORGE FLASHINGS

Boston (dealers)	9.50 to 10.00
Buffalo	14.00 to 14.50
Chicago	12.00 to 12.50
Cleveland (under 10 in.)	13.75 to 14.00
Cleveland (over 10 in.)	11.50 to 12.00
Detroit	11.25 to 11.75
Pittsburgh	15.50 to 16.00

FORGE SCRAP

Boston (dealers)	9.50 to 10.00
Chicago	18.50 to 19.00
Eastern Pennsylvania	14.50 to 15.00

ARCH BARS AND TRANSOMS

Chicago	22.00 to 22.50
St. Louis	20.00 to 20.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	9.00 to 10.00
Buffalo	14.50 to 15.00
Chicago	14.00 to 14.50
Cleveland	15.00 to 15.25
Eastern Pennsylvania	14.50 to 15.00
Pittsburgh	16.50 to 17.00
St. Louis	13.00 to 13.50

STEEL CAR AXLES

Birmingham	18.00 to 19.00
Boston (shipping point)	17.50 to 18.00
Buffalo	17.00 to 18.00
Chicago	18.50 to 19.00
Cleveland	17.25 to 17.50
Eastern Pennsylvania	22.00 to 23.00
Pittsburgh	21.00 to 21.50
St. Louis	19.00 to 19.50

SHAFTING

Boston (shipping point)	17.50 to 18.00
Chicago	19.75 to 20.25
Eastern Pennsylvania	22.00 to 23.00
New York (dealers)	18.50 to 19.00
St. Louis	17.50 to 18.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	16.00 to 17.00
Boston (consumers)	18.00 to 19.00
Buffalo	18.00 to 18.50
Chicago, iron	16.50 to 17.00
Chicago, steel	18.25 to 18.75
Cincinnati	14.50 to 15.00
Eastern Pennsylvania	18.00 to 19.00
New York iron (dealers)	15.00 to 16.00
Pittsburgh, iron	18.00 to 18.50
Pittsburgh, steel	20.00 to 20.50
St. Louis, iron	16.50 to 17.00
St. Louis, steel	18.00 to 18.50

NO. 1 CAST SCRAP

Birmingham, cupola	17.00 to 17.50
Boston	19.00 to 19.50
Buffalo	16.75 to 17.25
Chicago, No. 1 machinery	19.25 to 19.75
Chicago No. 1 railroad or agricultural	18.00 to 18.50
Cincinnati No. 1 Machinery cupola (net tons dealers)	18.50 to 19.00
Cleveland, cupola	18.00 to 18.25
Detroit (net tons)	15.50 to 16.00
Eastern Pennsylvania, cupola	18.00 to 19.00
New York, cupola (dealers)	14.50 to 15.00
Pittsburgh, cupola	18.00 to 18.50
San Francisco, delivered	24.00
Seattle	17.00 to 18.00
St. Louis, railroad	18.00 to 18.50
St. Louis, agricultural	18.00 to 18.50
St. Louis, machinery	20.00 to 20.50
Valleys	18.50

HEAVY CAST

Boston	16.50 to 17.00
Buffalo (breakable)	14.00 to 15.00
Cleveland	12.00 to 12.25
Detroit (automobile) (net ton)	19.00 to 20.00
Eastern Pennsylvania	16.00 to 16.50
New York (dealers)	14.00 to 14.50
Pittsburgh	14.50 to 15.00

MALLEABLE

Boston, railroad	18.50 to 19.00
Buffalo	18.00 to 18.50
Chicago, agricultural	17.00 to 17.50
Chicago, railroad	18.50 to 19.00
Cincinnati, railroad (dealers)	14.50 to 15.50
Cincinnati, agricultural (dealers)	14.50 to 15.00
Cleveland, agricultural	17.75 to 18.00
Cleveland, railroad	19.75 to 20.00
Detroit	18.50 to 19.00
Eastern Pennsylvania, railroad	15.00
Pittsburgh, railroad	18.00 to 18.50
St. Louis, agricultural	15.00 to 15.50
St. Louis, railroad	15.00 to 15.50

Miscellaneous Scrap

RAILS FOR ROLLING

5 feet and over

Birmingham	15.50 to 16.50
Boston (dealers)	13.50 to 14.00
Chicago	17.00 to 17.50
Cleveland	16.00 to 16.25
Eastern Pennsylvania	18.00 to 19.00
Pittsburgh district	19.00 to 19.50
St. Louis	16.50 to 17.00
New York	16.50 to 17.00

LOCOMOTIVE TIRES

Chicago, No. 1	19.00 to 19.50
Chicago, cut	18.50 to 19.00
St. Louis	17.00 to 17.50

LOW PHOSPHORUS PUNCHINGS

Chicago	17.50 to 18.00
Eastern Pennsylvania	18.00 to 19.00
Pittsburgh	20.00 to 20.50

Scrap

Weakness Continues With Prices Lower and Consumers Aloof—Offerings Large

ALL scrap markets are lower and the decline continues at a steady rate, despite efforts of producers and dealers to hold prices. In some centers buyers are receptive of bargains but each sale brings a lower level. Railroad lists aggregate a large total and lower bids are expected. Most contracts have been filled and dealers have little against which to buy offerings. Second quarter covering is being neglected. Speculation is absent in face of weakness and dealers are not bidding freely.

Chicago, March 31.—Continued weakness in iron and steel scrap has brought heavy melting steel down to $15.75 to $16.25, and the bottom is not in sight. A local steelmaker is reported to have bought a small tonnage of steel at $16, and some dealers claim to have done $15.50. Consumers are more apathetic. Only a few grades, like rolled steel wheels, of which the supply is small, manifest strength. Railroad offerings are heavy and include 50,000 tons by the Pennsylvania, 9000 by the New York Central, 5400 by the North Western, 2400 by the Santa Fe, 1800 by the St. Paul, 600 by the Nashville, Chattanooga & St. Louis, and blind lists by the Michigan Central and Erie.

Boston, March 31.—Heavy melting steel is dull in New England but this is offset by a newly developing demand for cast grades. Massachusetts and Connecticut foundries have taken between 500 and 600 tons of machinery scrap during the past week at $19 to $20 delivered. In a few cases textile scrap has sold as high as $21 delivered. A Bridgeport, Conn., consumer took several hundred tons of stove plate at $14 delivered.

New York, March 31.—While the Bethlehem Steel Corp. recently closed on another lot of 12,000 tons of melting steel, dealers have covered against this business and the scrap market again is dull. Most of this material is understood to have been taken at $15 delivered, and some dealers assert they would have no difficulty closing on as much tonnage again at this figure.

Philadelphia, March 31.—Two steelmakers inquiring for scrap give indication that a substantial tonnage may be placed in the next fortnight. Prices on some grades have been further reduced.

Pittsburgh, March 31.—Another drop in scrap prices is registered in the few small sales being made. A consumer in this territory, has bought, as well as one located down the Ohio river, both paying $17.50 to $18 for heavy melting steel. This and several other grades have declined 50 cents since a week ago. The Pennsylvania railroad list, on which bids close tomorrow, is the largest monthly list for the past year, involving over 50,000 tons.

Buffalo, March 31.—Consumers show some interest in heavy melting steel for second quarter. Firmness of prices has forced an advance in offers of some melters. Dealers believe a good tonnage could be sold within the district for $17, and that specially good grades would be worth $17.50. Dealers are holding the market steady by continued purchases although most contracts expire today.

Cleveland, March 31.—Little iron and steel scrap is moving in this district and prices are soft. Greater willingness by some melters to take material on contract is in evidence although one local steelmaker is holding up shipments and another is carefully regulating receipts. Interest in new obilgations is entirely lacking, activity being confined to dealer buying to cover contracts already in hand. Outlook for an early buying movement of consequence is not encouraging.

Detroit, March 31.—Continued slowing up marks the iron and steel scrap market. Dealers find no business is to be had even at concessions. A distinctly buyers market prevails and whatever is offered appears to receive consideration. Prices are unstable and quotations nominal. Little speculation and laying down in yards is going on as a result of the uncertain outlook.

Cincinnati, March 31.—Heavy yard stocks and large offerings of scrap are a burden on the market and consumers continue to hold aloof. Prices are about 50 cents lower this week and buying is slow at present quotations. Bidding on railroad lists is slow as dealers have little outlet for tonnage.

St. Louis, March 30.—The market for iron and steel scrap is off 25 cents to $2 per ton, the higher reduction being on iron rails. Since the only large consumer of iron rails here has quit using them—there is no market here and dealers must ship to Chicago or Terre Haute. Railroad lists include Wabash 1500 tons of miscellaneous rails; Pennsylvania System 4000 tons; Chicago, Milwaukee & St. Paul 3,500 tons; Union Pacific 2500 tons; Chicago, Burlington & Quincy 2500 tons.

Birmingham, Ala., March 30.—Iron and steel scrap continues quiet and no contracts are being made. Quotations show no change, though weak. Buying is in small lots.

Sheets

Buying Is Slightly Improved, Though for Prompt Use—Price Weakness Persists

WHILE business in the sheet market at Pittsburgh is reported slightly improved, buying is not extensive and users continue taking tonnage on a hand-to-mouth basis. Mills expect much larger demand from manufacturers of agricultural implements and automobiles, and from building construction enterprises. Some of the independent sellers are offering the principal grades $2 under the leading interest's figures, and $3 under on black sheets, which have been offered in some instances at 3.35c.

SHEET PRICES, PAGE 894

Pittsburgh, March 31.—Makers like the American Sheet & Tin Plate Co., maintaining 2.70c, 3.50c, 4.60c and 4.50c on blue annealed, black, galvanized and full-finished automobile sheets, respectively, report a fair amount of buying notwithstanding the fact $2 per ton less is available in the open market on blue annealed, galvanized and full-finished, and as low as 3.35c has been done on black sheets, a difference of $3 per ton. While contracting is not extensive, buying is improving, and all signs point to good business through the second quarter. Agricultural implement manufacturers are in better position than at any time since the war, and are ordering commensurately. The automotive industry is expanding its operations. Sheets used in building construction are in better demand. Sheet mill operations average 75 to 80 per cent.

Boston, March 31.—Sheets have declined further. The price on black now is 3.765c, delivered, equivalent to 3.40c, Pittsburgh.

Philadelphia, March 31.—Sheet contracting continues to lag. An important percentage of buyers have not yet covered for second quarter. Prices are unchanged at 2.60c to 2.70c, Pittsburgh, for blue; 3.40c to 3.50c for black, and 4.60c to 4.75c for galvanized.

Youngstown, O., March 31.—Interest in the sheet market continues to be characterized by hand-to-mouth buying. Tonnage placed during the week was slightly larger than in the preceding week but the business was written at

what sellers claim are unprofitable prices. With mill operation at 71 per cent, the incoming tonnage is not sufficient to build up backlogs. No change in price has occurred. Many producers believe minimum levels have been reached. Black sheets are being entered at 3.40c to 3.50c. Some mills are shipping tonnage on contract made early this year at 3.60c. Blue annealed is quotable at 2.60c to 2.70c. Galvanized can be had at 4.50c to 4.60c. High-grade sheets continue quotable at 4.40c to 4.50c. Buyers of this grade invariably stipulate immediate shipment, and not much business is being booked. An order for 1000 tons of high-grade sheets recently placed by a Detroit automobile producer has been shipped and the remaining 2000 tons held up temporarily.

Chicago, March 31.—Sheet mills are opening the second quarter with operations ranging from 90 to 100 per cent, but obtaining specifications to maintain this pace is difficult and the mills are operating on a week-to-week basis. Western mills claim they have experienced a better run of business the past ten days and that price cutting is being done almost entirely by the Valley makers. It is contended that the Gary and Indiana Harbor quotations on blue annealed range 2.70c to 2.80c, on black from 3.70c to 3.80c, and on galvanized from 4.75c to 4.85c.

Tin Plate

Mills Booked Up For Second Quarter —Large Needs Anticipated

TIN PLATE PRICES, PAGE 894

Pittsburgh, March 31.—Tin plate makers continue to discharge their obligations, with recently increased tonanges. No additional orders have been taken lately but within five or six week users will be better able to judge whether they will need more tonnage for second quarter. The majority of makers have all they can handle for the second quarter. Books are not yet opened for the third quarter. As soon as this is done, the influx of orders is expected to be large. While the American Sheet & Tin Plate Co. may possibly have to start up one of its three small idle plants soon, it remains on approximately an 87 per cent operating basis. The general average for the district is around 95 per cent. The price is unchanged at $5.50 per base box, f.o.b. Pittsburgh district mills.

Strip Steel

Most Second Quarter Buying Remains To Be Done

STRIP PRICES, PAGE 894

Pittsburgh, March 31.—More strip steel tonnage, hot and cold-rolled, remains to be placed for second quarter delivery than has been booked so far. Some automobile companies have signed second quarter contracts but the Ford Motor Co. and a few other large users have not closed yet. Buying in the Middle West is fairly heavy but the East is holding off. First quarter tonnages have been generously taken out. Stocks are low and material is wanted immediately. The cold strip minimum is 4.00c and hot strips are quoted at 2.20c to 2.40c. Operations average 65 to 70 per cent.

Pipe

Jobbers' Position Weaker—Mills Strong—Cast Prices Feel Foreign Competition

BOOKINGS of tubular products by mills continue sufficient to maintain 90 per cent operations. Jobbers lack strength and some cost and below cost selling has developed. Foreign competition has made a dent in prices at New York on cast iron pipe. On new bids on 12,000 tons of cast pipe for Detroit, French interests were low on the 24, 30 and 42-inch. B. Nichol & Co., representing French interests underbid American makers $1.03 a ton on 12,500 tons at Oneida, N. Y. Awards of the past week dropped off.

PIPE PRICES, PAGE 894 AND 930

Pittsburgh, March 31.—While the jobber situation in this territory still is badly mixed as regards pipe and tubular products, the mills' position is strong. Some jobbers have been selling their stocks at cost or even below cost, but this apparent weakness is not reflected by the mills which average 90 per cent operations. A natural gas line, 200 miles in extent, is projected for installation in Louisiana to Memphis, Tenn. This will take a large tonnage since sizes that will be used will start at 16-inch, 18-inch or 20-inch.

New York, March 31.—Quotations on cast iron pipe are tending downward, this being a reflection of foreign competition. While it is generally conceded foreign pipe could supply but a relatively small percentage of the requirements in this country and for that reason is not making as large a dent in the market as some recent quotations might indicate, it nevertheless is having an influence.

B. Nichol & Co., representing French makers, bid $46.40 a ton on 12,500 tons at Oneida, N. Y., mostly 20-inch size. The only other bid was for domestic pipe at $47.51 a ton. Both bidders quoted $110 a ton on specialties.

Chicago, March 31.—When Detroit opened bids, March 6, on some 12,000 tons of cast iron pipe, French pipe was 20 cents a ton low on the 12, 16 and 24-inch sizes, and at the opening of second bids, March 26, French pipe was low on the 24, 30 and 42-inch pipe.

This time bids were taken on 500 tons of 12-inch, 1140 of 16-inch, 4460 of 24-inch, 6340 of 30-inch and 425 of 42-inch. The freight from Birmingham to Detroit is $7.92. The bidders included the National Cast Iron Pipe Co., United States Cast Iron Pipe & Foundry Co., James B. Clow & Sons, Lynchburg Foundry Co., Standard Cast Iron Pipe Co., and B. Nichol & Co., New York, an importing house. The bids, on a delivered basis, were:

Twelve-inch Standard, $45; National $46.45; United States, $47.95; and Nichol, $45.65; 16-inch, National, $46.45; U. S., $47.95; Lynchburg, $47.65; Clow, $45.55; and Nichol, $46.65; 24-inch, Lynchburg, $45.65; Nichol, $45.50, and United States, $45.95; 30-inch, United States, $45.95; and Nichol, $44.23; 42-inch, United States, $45.95; Standard, $45; and Nichol, $44.23.

The United States company put in a lump sum bid of $45.95 for the entire tonnage. The National company was awarded some 3-inch pipe at 49 cents a foot. This company was low bidder at Chicago on 570 tons of 8-inch at $38.50, Birmingham. The Detroit bidding seems to warrant a spread on 6-inch and over, of $46.70 to $48.20.

CONTRACTS PLACED

107 tons, 6-inch class B pipe for municipal natorium, Richmond, Calif., to American Cast Iron Pipe Co.

200 tons, 2 to 8-inch class B pipe for Aberdeen, Wash., to American Cast Iron Pipe Co.

100 tons, work at Muskegon, Mich., to the National Cast Iron Pipe Co.

CONTRACTS PENDING

12,500 tons, Oneida, N. Y., B. Nichol & Co. representing French interests; low bidder.

1615 tons, 8 and 12-inch class B and C pipe for Los Angeles, Spec. 755-A; bids in.

761 tons, 4 to 8-inch class C pipe for San Bernardino, Calif.; bids opened.

100 tons, 4 and 10-inch class B pipe for Santa Ana, Calif.; bids in April 6.

2000 tons, Vernon, Calif., bids in.

1000 tons, two lots, of 500 tons each for the department of water supply, gas and electricity, New York, general contractors' bids asked; 8, 12 to 16-inch pipe is specified.

150 tons, 6-inch pipe for the Westchester county park commission, White Plains, N. Y., bids closed April 6.

Bolts, Nuts, Rivets

Situation Continues Steady With Satisfactory Buying

NUT AND BOLT PRICES, PAGE 894

Chicago, March 31.—Specifications for bolts and nuts continue on about the same plane, with improvement.

Automobile and implement industries still reflect a slight upward trend. The Ford Motor Co. has supplemented its monthly buying by fill-in orders. Most consumers have signed second quarter contracts on the basis of 50, 10 and 10 off for large machine bolts.

Pittsburgh, March 31.—Orders for nut, bolt and rivet industries here show some improvement. Orders are not large and buyers are taking material on a hand-to-mouth basis. Manufacturers, railroads and consumers at large are included among the buyers. Rivet competition still is keen although a few orders for single carloads develop and in some cases 2.50c is being met.

Philadelphia, March 31.—Bolt and nut consumers generally are covered for second quarter at 50, 10 and 10 off for large bolts. In spite of the lower price for first quarter, specifications on those contracts were only 60 to 70 per cent. Many consumers and jobbers have accumulated large stocks. Rivet demand is dull, structural rivets generally bringing 2.60c base, Pittsburgh. Boiler rivets are closer to 2.90c, Pittsburgh.

Iron Ore

Prices Not Yet Determined—Inquiries Total 1,000,000 Tons

Cleveland, March 31.—Prices of Lake Superior iron ore have not yet been determined. Attention has been focussed on the business the Ford Motor Co. is expected to place, but there does not seem to be a unanimity of opinion among sellers as to when it will be closed. Some look for action this week, and a definite price announcement; others believe it will be deferred longer. Certain producers say that the prices to be paid in this transaction will not be disclosed, and will not establish the market. In this connection one representative dealer stated that it is possible that the sale may be made at less than last year's prices. Inquiries pending in the open market total around 1,000,000 tons. Some ore cargoes are expected to be moved by the middle of April.

New York, March 31.—Considerable manganese ore inquiry is pending, Caucasian washed ore is 43 to 44 cents c.i.f. Indian ore is 44 to 46 cents. These are asking prices which might be shaded.

Iron Ore Imports Gain

Philadelphia, March 31.—Imports at this port for the week ending March 28, were as follows: 13,220 tons of iron ore from Spain; 7400 tons of iron ore from Algeria; 3575 tons of pig iron from Germany; 1003 tons of pig iron from British India; 1000 tons of pig iron from England; 203 tons of iron bars from France; 180 tons of steel blooms from Belgium and 50 tons of pig iron from Sweden.

Fairview Fluorspar & Lead Co., 506 Olive street, St. Louis, Mo., has reduced its capitalization from $500,000 to $2000.

Bars

Buying Less Active Than for First Quarter But Specifications Are Large

WHILE consumption of soft steel bars seems to be at the same rate as has prevailed since the first of the year, it is apparent that contracting for first quarter was heavier than needs dictated and some tonnage is being carried over to second quarter. This is limiting present buying. First quarter tonnages are being taken out fully because of the advantage in price. Steady shipments are expected to continue but without overloading producers. Deliveries on some sizes continue somewhat deferred.

BAR PRICES, PAGE 894

Chicago, March 31.—Specifications against soft steel bar contracts were heavier last week than in the week preceding and continue to exceed shipments, but new business is lighter. Consumption of bars does not appear to have decreased but buying has. Uncertainty as to price is increasingly a deterrent. While mills claim to be holding to 2.20c, Chicago, and some users have tried in vain to break the market, the fact that Pittsburgh mills are quoting close to the Chicago delivered price is significant. This situation is more likely to be corrected by lowering the Chicago price than by advance in the Pittsburgh mill price. Once the price situation is straightened out, it is believed the market will settle down to a run of steady but not spectacular business. The automobile situation reflects improvement weekly. The rail steel bar range continues 2.00c to 2.10c, Chicago, with new business considerably under shipments, considering all local mills. Rail steel is unchanged at 2.10c, Chicago. Bookings are lighter and single-turn operations are difficult to maintain at times.

New York, March 31.—About 60 to 75 per cent of first quarter steel bar contracts have been specified here by users in this district. Unspecified portions are being carried over. While numerous second quarter contracts have been placed at 2.10c, Pittsburgh, the fact that this carry-over is on the books at 1.90c to 2.00c, restrains some consumers from placing additional tonnage at 2.10c.

Philadelphia, March 31.—Specifications against first quarter contracts for steel bars have averaged 70 to 80 per cent of total commitments. One company has had specifications of 95 per cent of bookings. Some consumers are carrying over comparatively large stocks. In some cases unspecified first quarter bars are being carried into second quarter. The market on new business seems firm at 2.10c, Pittsburgh. Makers of bar iron have changed their method of quoting back to a Pittsburgh base, instead of f.o.b. mill. The market now is 2.00c, Pittsburgh or 2.32c, delivered, Philadelphia, for carloads.

Pittsburgh, March 31.—Merchant steel bar specifications on first quarter contracts during the closing days of the month have been brought practically to 100 per cent. These have come in easily because the price has been at least $2 per ton below the present market level of 2.10c. Some buyers have over-specified and these tonnages are being applied by mills against second quarter contracts. Some users are closing less tonnage for second quarter because first quarter purchases were heavier than consumption demanded. A slightly better buying rate is noted in refined iron bars. The price is unchanged at a 3.00c minimum.

Cleveland, March 31.—Specifications against first quarter contracts for bars have been such that from 85 to 95 per cent of tonnage has been taken out. With some larger producers, March tonnage entered for rolling exceeds February and the latter was a heavy month. Considerable second quarter buying has been done, some producers having probably 75 per cent of normal requirement of their consumers booked. Bar prices are steady at 2.29c, Cleveland or 2.10c, Pittsburgh.

Hoops and Bands

Fair Business Being Booked But Immediate Shipment Rules

HOOP PRICES, PAGE 894

Pittsburgh, March 31.—Only fair hoop and band business is developing new orders having fallen from the high level of a few weeks ago. Hoops and bands 6 inches wide and narrower, are at 2.40c minimum. Operations average 70 to 75 per cent of capacity. Orders are for rush shipment, indicating that no stocks are being carried.

Cold Finished Steel

Better Buying Being Done By Consumers—Market Is Steady

Pittsburgh, March 31.—Better buying is the rule among users of cold bars. This chiefly is automotive in character. Specifications against first quarter contracts are well in hand. The market price is better defined at 2.70c, although 2.80c still applies on small orders.

Structural Shapes

Awards Are Numerous But Involve Light Tonnage Compared With Heavy Volume of Inquiries—Prices Falter

ACTIVITY in the structural shape market has suffered a slight relapse from the high award total of last week. Contracts closed during the past week were confined mostly to small tonnages. The aggregate is good but is below expectations and estimations based on the large volume of pending work. Inquiries continue to be brought out in large numbers and a steady flow of tonnage to mills is believed assured. Some faltering in the price situation is noted. Philadelphia mills have taken business at 1.90c Pittsburgh, while at Boston one interest has cut to 2.00c Pittsburgh equivalent. Uncertainty prevails in Chicago plain material markets where a realignment of mill prices is expected to result from Pittsburgh interests naming a quotation approximating the Chicago mill level.

STRUCTURAL SHAPE PRICES, PAGE 894

Chicago, March 31.—Structural awards are light in comparison with the heavy volume of pending work. The uncertainty over the plain material quotation of 2.30c, Chicago, is a factor. Reports that this price has been shaded have been denied by the mills, but the fact that Pittsburgh makers are quoting a delivered price approximating the Chicago mill price is taken to indicate that the Chicago price is out of line.

Pittsburgh, March 31.—Inquiries for structural shapes during the past week have fallen off considerably although the number of propositions held over and still pending is large. Awards are fewer. The open market figure on plain material is 2.10c.

Boston, March 31.—The number of new small projects out for figures has increased but awards dropped. Prices hold at 2.465c Boston or 2.10c Pittsburgh except for one producer who quotes 2.00c Pittsburgh.

New York, March 31.—Structural buying is relatively light but considerable work is active, and the general tone of the market is good. Fresh inquiry includes at least five or six lofts, averaging fully 1000 tons each. Shapes are holding at the equivalent of 2.10c, Pittsburgh, with concessions available on sizable tonnages. An eastern structural fabricator is posting a sticker on its letter head reading: "We do not carry in our stocks, use or quote upon any foreign steel."

Philadelphia, March 31.—Some large lots of structural shapes were sold in this territory at 1.90c, base Pittsburgh. Prices range from that figure to 2.10c Pittsburgh which is being done on small tonnages. Orders are smaller than shipments and operations are being curtailed in some directions.

Cincinnati, March 31.—Structural activity last week was slow. Some substantial tonnages are pending but little new inquiry of importance is out and large orders are scattered. The market on plain shapes may be quoted at 2.10c Pittsburgh although some makers are attempting to get 2.20c.

Cleveland, March 31.—Quietness continues to rule in the local structural market. Large tonnages are lacking, and bookings of the week are almost nil by several fabricators. A 4500-ton hotel at Toledo is about to come out for bids. Plain material continues firm at 2.29c Cleveland or 2.10c Pittsburgh. Fabricated prices are showing some signs of stiffening.

Awards Compared

	Tons
Awards this week	**14,556**
Awards last week	**63,452**
Awards two weeks ago	**18,117**
Awards this week in 1924	**38,960**
Average weekly awards, March	**30,868**
Average weekly awards, 1925	**37,017**

CONTRACTS PLACED

1370 tons, highway bridge at Forest City, S. Dak., to St. Louis Structural Steel Co.

1300 tons, 20-story loft building for the Morro Realty Co., 135-139 West Thirty-sixth street, New York, to A. E. Norton, Inc.

1200 to 1500 tons, Lincoln Alliance bank, Rochester, N. Y., to Genessee Bridge Co.

1000 tons, Roosevelt apartment hotel, Brookline, Mass., to independent fabricator.

828 tons, Missouri, Kansas & Texas railroad bridges, to Wisconsin Bridge & Iron Co.

800 tons, two buildings for Paraffine Paint Co., Vernon and Santa Fe avenue, Los Angeles, to Moore Drydock Co.

600 tons, bridge work, for the Florida East Coast, to the Virginia Bridge & Iron Co.

600 tons, Dworman building, Brooklyn, N. Y., to Hedden Iron Construction Co.

500 tons, schoolhouse, Charleston, W. Va., to McClintic-Marshall Co.

500 tons, J. J. Thomas apartment, Jersey City, N. J., to unnamed fabricator.

500 tons, Olympia auditorium, Los Angeles, Eighteenth and Grand, to Philip Friedman & Son.

400 tons, Hotel Alexandria, Alexandria, Va., went reinforced concrete.

350 tons, warehouse for Standard Paper Co., Kalamazoo, Mich., to the Flint Structural Steel Co.

300 tons, Mutual Telephone Co. building, Erie, Pa., to the Jones & Laughlin Steel Corp.

280 tons, theater, Grand avenue and Lakeside, Oakland, Calif., to Judson Mfg. Co.

250 tons, building for Morton Salt Co. at Hutchinson, Kans., to McClintic-Marshall Co.

242 tons, channels for General Petroleum Corp., Los Angeles, placed with an eastern mill.

225 tons, Heavenrich store, Saginaw, Mich., to the Flint Structural Steel Co.

225 tons, plant on Fifty-second street and East river, New York, to unnamed fabricator.

200 tons, shop for Jerry O'Mahoney, Elizabeth, N. J., to Levering & Garrigues Co.

200 tons, Perry high school, Pittsburgh, to the J. E. Moss Iron Works.

200 tons, boiler house extension for the American Woolen Co., Lawrence, Mass., to the Palmer Steel Co.

100 tons, Manhattan Eye, Ear and Throat hospital, New York, to Eidlitz & Ross.

200 tons, acid plant for the Armour Fertilizer Works, North Carolina, to the Carolina Steel & Iron Works.

310 tons, Charles Myer loft, 48 West Forty-eighth street, New York, to Bethlehem Fabricators, Inc.

300 tons, apartment at 32 Washington Square, New York to Taylor-Fichter Steel Construction Co.

400 tons, Saint James Baptist school, Seventy fifth street, New York, to Bethlehem Fabricators, Inc.

200 tons, manufacturing building, Worcester, Mass., to Eastern Bridge & Structural Co. General contract to Aberthaw Co., Boston.

180 tons, building for Michigan Alkali Co., Wyandotte, Mich., to Rochester Bridge Co.

170 tons, substation J. Sacramento and Leidesdorf streets, San Francisco for Pacific Gas & Electric Co., to Western Iron Works.

155 tons, Bryant Heater & Mfg. Co., Cleveland, to T. H. Brooks Co., Geo. F. Fox, that city, architect.

139 tons, shaft sets for Montreal Mining Co., Ironwood, Mich., to American Bridge Co.

110 tons, Thropp Machine Shop, Trenton, N. J., to Frank B. Weaver Co.

100 tons, addition to plant of Jamestown Car Parts Mfg. Co., Jamestown, N. Y., to Kellogg Structural Steel Co.

CONTRACTS PENDING

9000 tons, Buffalo-Fort Erie bridge, bids to be received by Buffalo-Fort Erie Bridge Co., Ellicott Square, Buffalo, about June 1.

4500 tons, Commodore Perry hotel, Toledo, O.; bids to be asked soon.

2500 tons, Reading Co. car shops, Reading, Pa.; pending.

2000 to 3000 tons, apartment hotel, Seventeenth and Locust streets, Philadelphia; pending.

2000 tons, 5-story auditorium for city of Minneapolis; general and separate contractors' bids close April 20. Plans by Croft & Boerner, 1004 Marquette avenue, Minneapolis.

1600 tons, hotel, Twenty-ninth street, Coney Island, New York; specifications expected out shortly. George P. Post, 101 Park avenue, is architect.

1200 tons, Fayette-Greene county bridge, Masontown, Pa.; bids close April 10.

1050 tons, theater for Lubliner & Trinz, 25 East Jackson boulevard, Chicago; pending.

1000 tons, hotel at Oklahoma City, Okla.; pending.

950 tons, Bethlehem Engineering Co. apartment 100 West Fifty-fifth street, New York; pending.

900 tons, transmission towers for Antioch crossing for Pacific Gas & Electric Co., San Francisco; bids in.

900 tons, Germantown hospital, Germantown, Pa.; Irwin & Leighton general contractors, redesigning.

800 tons, theater, Market and Hyde and Grove streets, San Francisco; bids being received.

550 tons, Union Pacific railroad bridges; pending.

500 tons, plant addition for the Florence Pipe & Foundry Co., Florence, N. J.; bids asked.

400 tons, Mossdale bridge, Stockton, Calif.; pending.

400 tons, telephone building, Pasadena, Calif.; up for figures soon.

400 tons, bank, Tampa, Fla.; bids asked.

350 tons, government airplane hangar, Coco Solo, Christobal, Panama; pending.

350 tons, apartment at 2110 Pacific avenue, San Francisco; bids in.

350 tons, Walter Mason office building, East Fifty-third street, New York; pending.

350 tons, public safety building, Johnstown, Pa.; general contract awarded Berkebile Bros., Johnstown, Pa.

350 tons, hangars for government at Pearl Harbor, Hawaii; bids in April 8.

300 tons, office building, Tenth and Broadway, Oakland, Calif.; bids being received.

300 tons, East Orange hospital, East Orange, N. J.; bids asked.

300 tons, garage, 186th street and Washington, for the M. G. W. Realty Co., New York; pending.

300 tons, Y. W. C. A., 137th street, New York; bids asked.

300 tons, telephone exchange, South Orange, N. J.; pending.

300 tons, Krey office building, Boston, award postponed for two weeks.

250 tons, garage, Springfield, Mass.; bids asked.

250 tons, theater, Irving street, San Francisco; bids being received.

250 tons, recitation building, normal school, Bowling Green, O; bids in.

200 tons, Twelfth Church of Christ, Scientist, Chicago; plans by H. L. Cheney, 208 South LaSalle street, Chicago.

190 tons, theater, Western avenue and Tenth, Los Angeles; bids being received.

175 tons, Sewickley, Pa., high school; bids close early in April.

175 tons, Lafayette high school, Uniontown, Pa.; bids being taken.

175 tons, Benjamin Franklin high school, Uniontown, Pa.; bids being taken.

165 tons, apartment house, Pine and Stockton streets, San Francisco; bids being received.

150 tons, Shattuck warehouse, West Twenty-second street, New York; pending.

150 tons, building in Golden Gate park, San Francisco; Brode Iron Works low bidder but award will not be made for 30 days.

100 tons, Wilson theater, Fresno, Calif.; bids in.

100 tons, telephone building, San Diego, Calif.; up for figures soon.

100 tons, Walter Mason loft building, 35 West Forty-seventh street, New York; pending.

Tonnage unstated, Elks home, Buffalo; general contract awarded Charles Everett.

Concrete Bars

Few Large Awards Made But Aggregate Bookings Are Good

DESPITE a dearth of large tonnage contracts, the concrete bar market is active, and the aggregate of orders being booked is heavy. Inquiries are numerous, some involving fairly large tonnages. A few roadwork contracts have been placed but the majority of that tonnage still is prospective. Prices continue fairly firm in most districts from mills although some weakness has developed in bars from stock in the East. Pacific Coast building continues active several large warehouses being pending.

REINFORCING BAR PRICES, PAGE 894

Chicago, March 31.—The volume of pending reinforcing bar work continues all out of proportion to actual awards. Some of the hesitancy of proposed builders is attributed to the uncertainty over the mill price of bars and the consequent effect on the warehouse price. The Illinois Central railroad has about 400 tons of bars pending for various projects. Tentative awards have been made on some 2000 tons of Illinois road work. Practically all of this business is going to Kalman Steel Co., Olney J. Dean & Co. and the Truscon Steel Co. Warehouses are generally quoting about 2.70c, Chicago.

Boston, March 31.—A firmer tone is reported in concrete bars. Most recent sales out of Boston warehouses have been at 3.00c. The amount of new work being figured has increased.

Pittsburgh, March 31.—No large awards are reported this week in the reinforcing concrete bar market, but inquiries are plentiful. One of the largest inquiries pending here is for 550 tons for a warehouse. The 2.10c figure is considered the general market price on new billet bars although one seller maintains 2.20c, having a quotation of 2.50c f.o.b. its Youngstown warehouse on stock material.

Cleveland, March 31.—With the exception of several 100-ton awards, the concrete bar market was quiet last week. Inquiries for small tonnages are numerous but large work is lacking. New billet bar prices are firm at 2.29c, Cleveland or 2.10c, Pittsburgh. Rail steel is quoted at 1.90c to 2.00c mill. New billet bars from stock vary from 2.85c to 3.10c, according to tonnage and specifications.

Buffalo, March 31.—A number of contracts will be placed this week for reinforcing bars. Three are school jobs in Buffalo and vicinity each requiring 225 to 250 tons. Buffalo sellers have established a firm price of 2.75c, Buffalo, on all bars from stock.

Cincinnati, March 31.—Interest in reinforcing concrete bars is increasing and during the past week several large tonnage projects appeared. Carlot buying continues to furnish the bulk of current business. Prices display firmer tendencies with new billet bars out of Cincinnati warehouse continuing at 3.30c, while the mill price is 2.10c Pittsburgh.

St. Louis, March 30.—Considerable interest is shown in the outcome of the awards which were to have been made March 28 by the Missouri highway commission for road and bridge projects, requiring about 900 tons of reinforcing bars and 526 tons of structurals.

Awards Compared

	Tons
Awards this week	2,515
Awards last week	5,300
Awards two weeks ago	15,762
Awards this week in 1924	3,190
Average weekly awards, March	7,111
Average weekly awards, 1925	6,686

CONTRACTS PLACED

450 tons, Olympia Auditorium, Eighteenth and Grand streets, Los Angeles, to Los Angeles Iron & Steel Co.

320 tons, White Motor Truck Co., Twelfth and Mission street, San Francisco, to Edw. L. Soule Co.

250 tons, Illinois road work, to Kalman Steel Co.

200 tons, Philadelphia stadium foundations, Philadelphia, to Concrete Steel Co.

200 tons, apartment at Union and Washington boulevards, St. Louis, to Laclede Steel Co.

170 tons, garage, Cambridge, Mass., to Concrete Steel Co. General contract to S. C. Sperry Co.

150 tons, theater for Ure Building Corp., 1749 Howard street, Chicago, to Concrete Steel Co.

130 tons, science hall, Kenyon college, Gambier, O., to Bourne-Fuller Co.

125 tons, Neal Fireproof Storage Co., Cleveland, to Franklin Steel Works.

120 tons, warehouse for City of Los Angeles, to California Hardware Co.

100 tons, footings for new machine shop for G. A. Gray Co., Cincinnati, to Bourne-Fuller Co.

100 tons, high school, Jamaica, L. I., N. Y., to David H. Smith & Sons Co., Lustbader Construction Co. general contractor.

100 tons, Chinese Y. M. C. A., San Francisco, to Truscon Steel Co.

100 tons, church, Dayton, O., to Bourne-Fuller Co.

CONTRACTS PENDING

4700 tons, Estuary tube, Oakland, Calif.; general contract awarded A. J. Crocker Co. on concrete design.

1250 tons, third section Broad street subway, Philadelphia; pending.

800 tons, office at Nineteenth and Arch streets, Philadelphia; Wark Co. awarded general contract.

550 tons, warehouse for, Aronson Realty Co., Pittsburgh; general contract awarded Toupet Building Co., Inc., Pittsburgh.

500 tons, 10-story office building, 431 Penn avenue, Pittsburgh; Hunting-Davis Co., architect. Bids about to be asked.

500 tons, new plant for J. Charles McCullough Seed Co., Cincinnati; pending.

300 tons, Phelps apartment building, Cincinnati; Ohio Construction Co. awarded general contract.

300 tons, McCallum apartments, Philadelphia; Wark Co. awarded general contract.

300 tons, 9-story hospital addition, Boston; bids being taken.

200 tons, Headley warehouse, Chester, Pa.; pending.

200 tons, Bell telephone building, Reading, Pa.; pending.

175 tons, addition for Simplex Wire & Cable Co., Cambridge, Mass., general contract awarded Stone & Webster, Inc.

160 tons, warehouse, New Bedford Boiler & Machine Co., New Bedford, Mass.; bids being taken.

150 tons, warehouse for Demmler Bros. Co., Pittsburgh; general contract awarded the B. A. Groah Construction Co.

125 to 150 tons, building for Brooks Co., Cleveland; pending.

120 tons, paper warehouse, Woronoco, Mass.; bids being taken.

100 tons, suburban hospital, Bellevue, Pa.; general contract awarded the B. A. Groah Construction Co.

100 tons, Memorial hospital addition, Pittsburgh; bids being taken.

100 tons, Harding high school, Steubenville, O.; bids close April 5.

Tonnage unstated, 5-story auditorium for city of Minneapolis. Contractors' bids close April 20. Croft & Boerner, 1004 Marquette avenue, Minneapolis, architects.

Tonnage unstated, addition to St. Paul branch of Montgomery, Ward & Co., Chicago. General contract to George J. Grant Construction Co., St. Paul.

Tonnage unstated, remodeling building for New Coliseum Co., 2608 Washington avenue, St. Louis. General contract to Natatorium Construction Co., 50 East Forty-second street, New York.

Rails, Cars

Railroad Buying in Lull—Equipment Orders Scattered and Rails Continue Inactive

BUYING of iron and steel products by railroads shows a decided lull. Inquiries and orders for equipment are scattered and involve but small lots. The largest car activity of the week was the decision by the Southern Pacific to build 870 box cars and cabooses in its own shops. A few miscellaneous locomotive orders were closed last week. Makers of billet light rails have cut quotations to 1.75c, Pittsburgh, a $1 a ton drop. Track accessory demand is spasmodic.

RAILROAD TRACK MATERIAL PRICES, PAGE 894

Pittsburgh, March 31.—For about a week large makers of billet-rolled light rails have been quoting 1.75c a decline of $1. In one or two cases, 1.70c competition is being met on desirable lots. Some of the rail-steel light rail sellers are maintaining a like base, while one or two still offer concessions of $1 or $2 per ton. Demand is spasmodic. Track bolt makers are inclined to hold to a 4.00c minimum but 3.90c has been done on tonnage orders. Standard spikes in desirable lots are available at 2.80c. Tie plates continue quotable at a minimum of 2.35c.

New York, March 31.—Car orders in this district continue fairly numerous but in the aggregate do not involve many cars. New inquiry is far from encouraging.

Southern Manchurian railways are inquiring for 100 miles of pound rails equivalent to 7900 tons. Americans are quoting about $40 a gross ton c.i.f. and Europeans $35 to $36.

Chicago, March 31.—Small miscellaneous lots of rails and track fastenings were placed here last week but the market appears to be in the lull preceding the usual secondary buying. The Chesapeake & Ohio has not yet placed 6000 tons of angle bars, spikes and bolts to accompany its recent 30,000-ton rail order. It appears that the New York Central and not the Pennsylvania railroad was the inquirer for 10,000 tons of tie plates last week.

ORDERS PLACED

The Standard Oil Co. of New Jersey, 15 tank cars, to the American Car & Foundry Co.; the cars are for export.

Piedmont & Northern, 150 automobile cars, to the Pressed Steel Car Co.

Central of Vermont, six caboose cars, and 20 milk cars to own shops.

New York Central, 50 passenger cars, awarded as follows: 25 to the American Car & Foundry Co., 15 to the Standard Steel Car Co., and 10 to the Pressed Steel Car Co.

Southern Pacific, 800 box cars and 70 cabooses, to own shops.

Northern Pacific, 10 passenger cars, to the Pullman Car & Mfg. Co.

Calorie Co., 10 tank cars for shipment to Brazil, to Middletown Car Co.

Chicago, Western & Indiana, 280 center constructions to Pullman Car & Mfg. Co.

Florida East Coast, two diners, to the Pullman Car & Mfg. Co.

Missouri Pacific, repairs to 2000 gondolas, divided between North American Car Co., Sheffield Car & Equipment Co., American Car & Foundry Co. and Pennsylvania Car Co.

Carnegie Steel Co., 50 gondola bodies, to Pressed Steel Car Co.

New York Central, 100 air dump cars, to Clark Car Co.

ORDERS PENDING

Florida East Coast, 30 coaches; bids asked.

New York Rapid Transit Corp., two crane cars and two flat cars; pending.

Oneida & Western, several caboose cars; pending.

Illinois Traction system, 50 to 100 hopper cars; pending.

Erie, 30 passenger car underframes; pending.

Kansas City, Mexico & Orient, 500 cars, 350 box, 100 stock and 50 automobile cars; pending.

Adjourn Bethlehem Case for Two Weeks

Washington, March 31.—Adjournment of the case of the federal trade commission attacking the acquisition of properties by the Bethlehem Steel Co. was taken March 25 in Philadelphia. Hearings will be resumed in about two weeks. No place has been

Among the last witnesses to testify at Philadelphia were Milton R. Mackell, assistant purchasing agent, Morris-Wheeler Co., Inc., Philadelphia, iron and steel jobbers; John D. Landis, purchasing agent, Philadelphia & Reading railroad, and Charles P. Soden, vice president and treasurer, John Illingworth Co., Frankfort, Pa., manufacturer of crucible steel and alloy steel merchant bars.

Mr. Mackell, who formerly was with the Cambria Steel Co. and the Midvale Steel & Ordnance Co., was asked about competition between these companies, the Bethlehem company and others. Mr. Soden said his company's purchases have been made from a number of sources. He said the Bethlehem company recently took some large accounts from his company because of low prices. He testified that he believed that the Crucible Steel Co., since its consolidation, had reduced prices, although prices had advanced since the United States Steel Corp. organization.

Wire

Nail Specifications Continue Heavy—First Quarter Prices Carry Into Second

WHAT practically is an extension of first quarter contracts into second quarter has had the effect of putting the market at Chicago on a basis $2 lower than the nominal figure. Eastern mills claim the higher figure for second quarter will be held, though there is no buying to test the situation. Specifications for nails are heavy and feature the market. Coated nails have been slashed by some independent makers. Operations hold up well but specifications are growing somewhat lighter in some sections.

WIRE PRICES, PAGE 894

Chicago, March 31.—What amounts to extension of first quarter contracts has eliminated the top of the recent spread of $2 in wire and wire products and plain wire is now quoted at 2.70c, base Joliet and Waukegan, and wire nails at 2.85c. Independent mills have slashed coated nails and the market is now quoted on the basis of 2.25c, Joliet and Waukegan. Specifications show few changes, but the trend is downward. Mill operations are down to about 70 per cent. Manufacturing lines show slight improvement, largely due to revival in the automobile industry.

Pittsburgh, March 31.—Nail specifications continue to feature wire products. Mixed carload orders are frequent from jobbers, and specifications from manufacturers are keeping up. Building programs, maintained at a high rate in various parts of the country, are responsible. Makers for the most part are discharging obligations on the 2.85c nail base. Practically no buying is being done at the 2.95c nail base but producers claim that to be the firm quotation on future business. Operations average about 80 per cent.

New York, March 31.—With April at hand, nail contracts will come up shortly for renewal. The indications are that 2.85c, Pittsburgh, will be the price.

Boston, March 31.—While specifications for wire and wire products have recently increased, the market is far quieter than a year ago and buying for second quarter is sluggish. Worcester producers are quoting 2.85c base. Nails are unsettled at 2.85c to 3.00c Worcester. The Boston nail market ranges from 2.75c to 2.85c, Pittsburgh base.

Nonferrous Metals

Prices Fall Except on Aluminum—Buyers Stay Away—Copper Exports Lower—Brass Products Cut Again—Zinc Down

Prices of the Week

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Spot Tin, N. Y. Straits	New York Lead	St. Louis Lead	St. Louis Zinc	Aluminum 98-99%	Antimony Spot	Nickel Ingot
Mar. 25	14.12½	14.25	13.65	53.87½	8.85	8.50	7.37½	27.00	14.12½	31.00
Mar. 26	14.00	14.12½	13.62½	54.25	8.75	8.40	7.37½	27.00	14.00	31.00
Mar. 27	13.75	14.00	13.37½	53.50	8.70	8.35	7.25	27.00	13.75	....
Mar. 30	13.50	13.75	13.12½	52.00	8.50	8.12½	7.05	27.00	13.50	31.00
Mar. 31	13.50	13.75	13.25	52.12½	8.37½	8.02½	7.00	27.00	13.75	31.00

NEW YORK, March 31.—Prices of metals and metal products have undergone sharp reductions this week. These drops have brought quotations back to the October levels from which they sprang on the election buying movement of last autumn. While there have been few outstanding bear developments affecting the metals, constructive news has been lacking to instill buying confidence.

The markets have been sentimentally weak, both here and abroad, though consumption is high and statistical positions are excellent. Trade has been declining, both in Germany and France, due to political or economic causes. In France the possibility of inflation and instability in the value of the franc are causing unsettlement.

American spring business has been showing promise. Automobile demands have shown a notable gain, while building and electrical requirements over the next few months would seem to involve a formidable tonnage of metal products. However, speculative sentiment all over the world has had a severe jolt, as reflected in the stock market, and some important foreign bull accounts in metals have been liquidated in recent weeks. Producers are not anxious sellers and prices have been driven down on relatively insignificant offerings and sales. Consumers continue to buy what they need as they need it.

Copper—Electrolytic copper prices have dropped ½ cent a pound the past week and 1¾ cents from the January high. London has led the decline, with regular reductions in prices quoted by dealers abroad; met by American agencies, these prices have necessitated adjustment in American home prices and finally in the prices of rolled and drawn products.

Wire—Open market prices for copper wire have worked steadily lower in sympathy with declining copper quotations. On March 30 the open market price for bare wire was 15.25c to 15.37½c, or the regular differential of 1⅞ cents under the Connecticut delivered price for electrolytic copper. Weatherproof and magnet wire were quoted 16.75c to 17c.

Rolled products—The American Brass Co. announced reductions March 26 and March 30. The reduction March 26 involved ¼ cent on rolled brass, all seamless tubes and sheet copper; other copper products and wire, ⅜ cent. The March 30 reduction was a cut of ¼ cent on all products, including wire.

Zinc—A week ago the London and St. Louis markets reached a relationship which made possible some export sales. Subsequently, on March 30, London zinc prices broke sharply, forcing a fresh adjustment in our market to prevent arbitrage transactions whereby American would rebuy its export contracts. Inasmuch as American slab zinc production exceeds domestic consumption, our market is bound to be affected promptly by changes abroad. The price has dropped from 7.40c recently to 7.00c, E. St. Louis.

Lead—The American Smelting & Refining Co. announced reductions totaling $10 a ton the past week of 1/6 cent a pound. The first was March 26, from 9.00c to 8.75c and the other was March 30, from 8.75c to 8.50c, New York. These drops were anticipated by previous reductions in the open market.

Tin—Strong London houses have been in a contest in London, three on the long side and one on the short side of the market. Prices have moved in London and New York with little rhyme or reason and the American professional trade has been outguessed on a good many days lately. Prices for spot and futures Straits tin dropped to 52.00c, a new low for the year, March 30. Stocks of tin here have increased lately.

Antimony—The premium on actual spot has diminished with arrivals from the Orient, now being only about 1 cent. Spot may be quoted 13.75c, duty paid.

Aluminum—The aluminum market is unchanged.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
High brass	18.12½
Copper, hot rolled	21.75
Zinc, ga. 9 to 18 (plate ½c less)	10.25
Lead, full sheets (cut ¼c more)	12.50 to 13.00
Aluminum, bright flat, up to 10 gage	37.50
SEAMLESS TUBES	
High brass	22.75
Copper	23.75
RODS	
High brass, round, ⅝ to 2½-inch	15.87½
Naval brass	18.62½
WIRE	
Copper	15.25 to 16.00
High brass	18.62½

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
New York	8.50
Chicago	8.75 to 9.00
Cleveland	8.75 to 9.00
HEAVY YELLOW BRASS	
New York	6.75
Chicago	7.25 to 7.50
Cleveland	7.00
ZINC	
New York	4.00
Cleveland	4.00 to 4.25
HEAVY COPPER AND WIRE	
New York	11.00
Chicago	11.25
Cleveland	11.00
RED BRASS TURNINGS	
New York	8.00
Chicago	8.00 to 8.25
Cleveland	8.00
YELLOW BRASS TUBING	
Cleveland	7.25
NO. 1 BRASS ROD TURNINGS	
New York	7.75
Chicago	8.25
Cleveland	7.50
LIGHT COPPER	
New York	9.25
Chicago	9.25
Cleveland	9.25
LIGHT BRASS	
Chicago	6.50 to 6.75
Clippings, Chicago	9.50
ALUMINUM	
Borings, Cleveland	12.00
Old sheet, Cleveland	17.50 to 18.00
Clippings, Cleveland	21.00

Secondary Metals

Remelt aluminum No. 12	22.50 to 23.00
Brass ingot 85-5-5-5	11.00

Coke By-Products

Japanese Are Inquiring for Sulphate—Distillates Are More Active

New York, March 31.—Japanese inquiry has come into the sulphate of ammonia market for the first time in many weeks. It includes several round lots. Prices considerably lower than the recent nominal market probably will have to be done if much business is to be closed. The Japanese price views appear around $2.40 to $2.50, port, in double bags. Domestic activity is confined to rounding out requirements of the fertilizer manufacturers. Prices on this business range $2.50 to $2.55 works.

Light oil distillates are moving in good volume. The rubber interests and the paint and varnish manufacturers, and particularly lacquer manufacturers, are buying toluol and benzol in substantial quantities. Prices are unchanged at 24 cents works in tanks and 25 cents in drums for pure benzol; 22 cents works in tanks and 27 cents in drums for 90 per cent benzol; 26 cents in tanks and 31 cents in drums for toluol, and 25 cents in tanks and 30 cents in drums for solvent naphtha. Commercial xylol is quoted at 26 cents in tanks and 31 cents in drums.

Naphthalene is unchanged at 7½ cents works for balls in carload lots and 6½ cents for flakes. The market is fairly active. Phenol continues 27 cents works local warehouse for spot and 25 cents works for futures.

Coast Sees Revival Near

Market Still Quiet But Indications Point To Better Buying—Oakland Tube Contract Is Awarded

BY AIR MAIL

SAN FANCISCO, March 28.—Indications point toward revival of interest in iron and steel on the Pacific Coast. Construction activity is being well maintained. Building in Los Angeles for March continues at a rate which indicates a possible total of $15,000,000 for the month. Up to March 17, 2596 permits were issued with an estimated value of $8,484,954, compared with 2128 permits and a valuation of $6,955,017 for the corresponding period in February and 1924 permits and an estimated value of $10,248,601 for the first 17 days of March 1924.

Pig Iron and Coke

Movement of foundry iron has been confined to small lots, no large inquiries being up for figures at present. Stocks in foundry yards are reported sufficient to take care of requirements for 30 days.

Coast Pig Iron Prices

No. 2 Columbia, San Francisco	$28.00
No. 2 Columbia, Los Angeles..	28.00
No. 2 Columbia, Portland.....	29.00
No. 2 Columbia, Seattle	29.00
*Dutch (2.75 to 3.25)	25.00 to 26.00
*Indian iron	26.75 to 27.75
½ Belgian (2.75 to 3.25)	26.00 to 28.00
*English iron (2.00 to 2.50)	26.75 to 27.25
*English iron (2.50 to 3.00)	27.25 to 27.75
*English (3.00 to 4.00)	28.00 to 28.50

*C.i.f. duty paid, coast ports.

Several importers report difficulty in securing full cargoes of coke from their European connections. Demand for coke reflects the quiet condition of the pig iron market. The better grades of English coke are quoted around $18 delivered. Several fair sized orders for Swedish ferrosilicon have been booked for May shipment at $93 a ton, incoming dock.

Bars, Plates and Shapes

Only six of 14 open hearths in the Bay District are in operation this week. All three of the Judson Mfg. Co.'s are idle and only two are active at the South San Francisco plant of the Pacific Coast Steel Co. Mill operators report no improvement in demand for merchant bar material. One consumer this week placed 100 tons with an eastern mill at 2.65c c.i.f. Local prices hold at 2.60c f.o.b. San Francisco, 2.55c applying in lots of 100 tons or over to jobbers. Concrete bars are moving more freely and awards this week exceeded 3000 tons. A fair volume of business is up for figures.

Demand for plates has improved and awards this week exceeded 750 tons of which the General Petroleum Corp. took 500 tons for storage tanks. Bids on the Oakland Estuary tube, on which figures were asked for both concrete and steel, involving 6000 tons of plates or 4700 tons of concrete bars, were opened this week and the general contract let to A. J. Crocker Co. on the concrete basis. The following tonnages are involved in pipe lines up for figures; Tacoma 660 tons, Seattle 120 tons, Vancouver, B. C. 350 to 4300 tons, 250 tons Flagstaff, Ariz. and 500 to 1000 tons for Vista, Calif. Other inquiries for tanks bring the total up to 8500 tons. Prices as far as can be ascertained remain at 2.50c c.i.f. although a 2.45c price is rumored.

Plain structural material holds firm at 2.55c c.i.f. Demand is improving and more activity is noted. Awards this week totaled 2400 tons the largest single award involving 500 tons for the Olympia auditorium in Los Angeles taken by Philip Friedman & Son. Business up for figures exceeds 10,000 tons.

Other Finished Material

The city of Los Angeles has awarded 400 tons of 82-pound rails to the United States Steel Products Co. No other inquiries are out.

Awards of cast iron pipe this week totaled only 300 tons. Pending business, however, involves over 3500 tons. Prices continue unchanged at $53 to $54 a ton delivered.

Blue annealed, black and galvanized sheets are now being quoted generally at 2.60c, 3.40c and 4.60c base Pittsburgh or equivalent respectively. Business offered is not heavy, consumers still adhering to the policy of buying only for immediate requirements. The Columbia Steel Corp. is now operating its four stands while the Pacific Sheet Steel Co. is running four out of six.

Out-of-stock distributors report an encouraging improvement in demand so far this month and state that approximately 15 per cent more business than last month has already been put through. Activity embraces all items. No changes have occurred in prices lately.

Statement of the Walworth Mfg. Co., Boston, manufacturer of valves and wrenches, shows a decline in net profits for 1924 as compared with 1923. Gross sales for 1924 were $3,673,578 and for 1923 $4,903,848.

Northwest Marks Time

SEATTLE, March 25.—Although active spring buying of steel is lacking prices remain fairly steady. Demand is restricted to small lots for immediate requirements. Neither merchants nor manufacturing plants are accumulating stocks. Orders are not being placed in large volume but the turnover as a whole is steady.

State of Washington is seeking bids for more than 50 miles of road construction. Oregon and Idaho also have extensive road building programs under way. April 14 Washington highway commission will open bids for 13 miles of concrete paving and other work including a reinforced concrete bridge, 221 feet long, T-beam type, King county.

Great Northern railroad is planning to spend $850,000 in improvements. Forty two miles of steel rails will be laid and a new freight terminal and 25 stall roundhouse will be built at Troy, Mont.

Pig Iron And Coke

Pig iron is quiet as melters have their requirements covered for first half. Columbia iron is arriving in considerable volume and the trade is not much interested for second half. Some import iron is afloat, for early arrival here. One foundry is reported to have placed an order for 450 tons of Royal Dutch continental iron which is offering here at $24.50 gross c.i.f. or $25.35 gross f.o.b. plant. There is little price difference between Columbia and import grades of iron.

Increasing quantities of Fernie coke are being sold, several plants having ordered it for prompt arrival. Fernie is selling at $14.60 here.

Bars, Plates And Shapes

Bar prices are unchanged the local mill quotation still being 2.55c. The local plant has a fair number of orders on the books although business continues in small tonnages. Reinforcing material is in better demand than merchant bars.

There is little activity in plates and shapes. Prices remain unchanged from a week ago, the best level on plates being 2.50c. While shapes are quoted at 2.55c buyers state desirable lots can be purchased at 2.50c. Structural steel for the Bedell building is arriving at Portland by water from the East. This contract involves about 1300 tons. Poole & McGonigle are the contractors.

Finished Materials

Wholesale jobbers report less activity than should reasonably be expected at this season. Warehouse prices are unchanged. Seattle and Portland jobbers are using the same price list. There has been some price cutting in both districts but it has been more noticeable in Portland.

No. 1 cast iron scrap is showing an average price of $17 to $18. Demand is not active, some foundries using cheap pig iron in lieu of scrap. One lot of 100 tons of No. 1 machinery scrap is offering at $17 and a pool of foundries is expected to close for it. There is no change in steel scrap from last week.

City of Seattle is in the market for 12,000 feet of stranded copper cable and also for 4300 feet of 1-inch 6 strand 7 wire straight lay crucible cast street railway cable.

European Markets Are Firmer

Barrow District, England, Ships 3500 Tons of Pig Iron to Philadelphia—Australia Places Orders for Four Warships—Denmark Buys Rails in Belgium — German Locomotive Builders Form Syndicate

By Radiogram

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, March 31.—An improvement is apparent in the Middlesbrough pig iron market, after many weeks of dullness. Prices are firm; two blast furnaces have been started during the week, and only one blown out. The outstanding transaction of interest is the shipment of 3500 tons of pig iron from the Barrow-in-Furness district to Philadelphia.

Australia has placed on order for two cruisers with John Brown & Co., Clydebank, near Glasgow. The cost will be £4,000,000 ($19,120,000). Two submarines also were placed with Vickers Ltd., the cost being about £716,340 ($3,424,105).

The British steel market is slightly more active. The tin plate trade is brighter; galvanized sheet prices are firmer. Belgian bolt iron is being offered at £7 10s ($35.86) delivered in England, against the British makers' price £11 1s ($52.82).

Denmark has placed an order for 6000 tons of rails, and accessories with Societe John Cockerill and Societe d' Ougree, near Siege, Belgium.

Belgian markets are firmer. French markets are firmer, but nervous. A report from Germany states a locomotive syndicate has been organized.

British Steel Market Shows No Sign of Recovery

European Staff Special

BIRMINGHAM, Eng., March 20.—No sign of recovery has appeared. For the present, the operating furnaces are not diminished in number, but a steelworks at Briton Ferry has been closed down, and at Bilston, South Staffordshire, Hickmans, Ltd., have dismissed 700 men through lack of orders. This puts out of action two large mills. Production is concentrated on the big skelp mill for the products which it is understood the allied firm of Stewarts & Lloyds maintains a good demand.

Pig iron prices are rather weak, but there is now no margin left to play with, and makers threaten to shut down their furnaces rather than take further reductions. No. 3 Cleveland continues at £3 18s ($18.64) and East Coast hematite at £4 5s ($20.31). Stocks are rather heavy in the Cleveland area. For several weeks, no forward buying has taken place and pig iron stocks in the hands of consumers are becoming scarce, indicating that any upward movement would be immediately followed by forward buying. The position is similar with steel users. Structural engineers have exhausted their reserves of standard sizes, and are watching the market closely in readiness to place good tonnages.

The only department showing any life is structural steel. A lot of small and moderate enterprises are in hand, enabling the engineers to get some reserves of business. Some of these have a few months work in hand. Unfortunately, in building operations large use is made of Belgian joists which are being bought by importing merchants and stocked in all the standard lengths usually employed in building. Any exceptional length has generally to be ordered in this country, as the foreigners require several weeks for delivery. Some orders have lately been placed at home although costing

Sterling $4.78

more, because the builders cannot wait the requisite time to get delivery of foreign steel.

Almost the onlv rail order placed for some time has been booked by the Barrow steelworks, 15,000 tons of steel rails from a dominion government. This order was obtained in spite of a German quotation of £1 15s ($8.36) per ton less.

Foreign competition is keen. The Belgians are not pressing their products on the market so aggressively as of late, but prices are very much below British quotations. A telegram was received on the Exchange yesterday from Brussels announcing a rise of 1s ($0.23) in the price of billets and naming £6 8s 6d ($30.72) delivered as the figure for billets and £6 9s 6d ($30.95) for sheet bars. These, however, are not representative quotations, although they appear to indicate a firmer market. Belgian billets are offered here at £6 5s ($29.87) against the English price of £7 ($33.46). For finished steel it is easy to buy joists £2 ($9.56) below the British price of £8 15s ($41.82) delivered.

Steel scrap is sold with difficulty, the recent figure of £3 12s 6d ($17.32) is now a top price, some business being done on a somewhat lower basis. There are large stocks in users' yards sometimes running almost into train loads, and merchants still complain of their customers declining to take deliveries on old contracts.

Galvanized sheets are rather easy on the basis of £16 ($76.48) to £16 5s ($77.67), but production is still continuing on a fairly heavy scale. Black sheets are slightly quieter, but their wide utility for a number of hollow-ware, hardware and constructional purposes gives them an advantage in comparison with some other products.

In tin plate, orders have shown some improvement. Now that the stabilization committee has renewed its term of operations until next October and the price of £1 2s 1½d ($5.28) is confirmed, some business has been brought out, buyers apparently being satisfied that nothing is to be gained by waiting. New business is coming from the Continent, South America and to some extent from the Far East. Australia at present is not a good buyer, but this is usually regarded as a fairly secure market. It is believed that the Australian orders which should soon be coming in good volume are for the present merely postponed.

French Combines Make Minimum Prices

European Staff Special

Paris, March 20. — The tendency among French producers of iron and steel to combine with the view of fixing minimum prices is increasing. Pig iron producers have come to an agreement until June 30 when it may be renewed, and the minimum price for foundry pig iron 2.5 to 3 per cent silicon is 335 francs per metric ton ($17.20) f.o.b. furnace for 100-ton lots on the domestic market. This agreement does not include hematite pig iron producers. An organization includes semifinished steel producers and bar and shape mills. Plate and sheet mills are not included but efforts are being made to induce them to join because some semifinished steel mills also turn out plates and sheets,

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, March 30	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgian and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Despatch—By Cable	£ s d			Francs		Francs	£ s d	
PIG IRON								
Foundry No. 3, Silicon 2.50—3.00	$18.64	3 18 0*	$18.49	345	$18.35	355	$19.84	4 3 0
Basic	19.12	4 0 0	19.83	370	18.10	350	23.28	4 17 6
Basic-bessemer	20.91	4 7 6†	17.69	330	17.32	335	19.84	4 3 0
Hematite, Phosphorus 0.02-0.05	20.08	4 4 0	23.32	435	.....	...	23.90	5 0 0
SEMIFINISHED STEEL								
Billets	$31.07	6 10 0	$26.00	485	$25.85	500	$24.38	5 2 0
Wire rods	52.58	11 0 0	34.57	645	33.61	650	32.98	6 18 0
FINISHED STEEL								
Standard rails	$40.43	8 10 0	$27.34	510	$28.44	550	$28.68	6 0 0
Merchant bars	1.76c	8 5 0	1.29c	530	1.25c	535	1.25c	5 15 0
Structural shapes	1.71c	8 0 0	1.22c	500	1.21c	515	1.19c	5 10 0
Plates, ship, bridge and tank	1.87c	8 15 0	1.62c	660	1.52c	650	1.51c	6 19 0
Sheets, black, 24 gage	2.56c	12 0 0	2.99c	1,230	2.67c	1,140	2.71c	12 10 0
Sheets, galvanized, 24 gage, corrugated	3.47c	16 5 0	4.23c	1,740	5.21c	2,225	3.69c	17 0 0
Bands and strips	2.35c	11 0 0	1.65c	680	1.76c	750	2.06c	9 10 0
Plain wire, base	2.35c	11 0 0	2.14c	880	1.99c	850	2.01c	9 5 0
Galvanized wire, base	2.99c	14 0 0	2.87c	1,180	2.57c	1,100	2.39c	11 0 0
Wire nails, base	3.09c	14 10 0	2.38c	980	2.11c	900	3.04c	14 0 0
Tin plate, base box 108 pounds	$ 5.28	1 2 1	.....	...	.....	...	$ 6.69	1 8 0
Domestic Prices at Works or Furnace—Last Reported								Renten Marks
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$18.64	3 18 0	$18.22	340(2)	$18.35	355	$20.70	90
Basic pig iron	19.12	4 0 0	18.22	340(1)	17.32	335	22.43	97.50
Furnace coke	3.80	0 16 0	7.61	142	7.24	140	5.52	24
Billets	31.07	6 10 0	24.12	450	26.37	510	27.60	120
Standard rails	1.81c	8 10 0	1.24c	510	1.40c	600	1.48c	142
Merchant bars	1.81c	8 10 0	1.32c	545	1.31c	560	1.34c	128
Shapes	1.76c	8 5 0	1.22c	500	1.28c	545	1.30c	125
Plates, ship, bridge and tank	1.97c	9 5 0	1.64c	675	1.59c	680	1.46c	140
Sheets, black, 24 gage	2.67c	12 10 0	3.04c	1,250	2.69c	1,150	2.92c	280
Sheets, galvanized 24 gage, corrugated	3.47c	16 5 0	4.23c	1,740	5.27c	2,250	5.22c	500
Plain wire	2.35c	11 0 0	2.50c	1,030	1.99c	850	1.93c	185
Bands and Strips	2.45c	11 10 0	1.65c	680	1.76c	750	1.67c	160

* Middlesbrough; †Scotch foundry iron; (1) Basic-bessemer; (2) Longwy. British export furnace coke £1 5s 9d ($6.15) f. o. b. Ferromanganese, £15 10s 0d ($74.09) f. o. b. The equivalent prices in American currency are in dollars per ton for pig iron, coke, semifinished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

and it is thought a minimum price for these commodities also should be fixed. The object of these organizations is only to fix a minimum price in order to obviate destructive competition. The name chosen for the steel syndicate is Office des Statistiques des Produits Metallurgiques, or statistical bureau of metallurgical products, known as the O. S. P. M. However, it can be assumed that if these first attempts at grouping interests are successful they may develop into a more complete organization controlling production and sales.

German High Prices Limit Exports

European Special Service

BERLIN, March 19.—Comparatively high prices quoted on German iron and steel material for export prevent German producers from doing much business in foreign markets. Since activities in the domestic market are decreasing there is a tendency for producers to offer concessions for export. Some sales of bars and wire rods have been made to the Scandinavian and Border States. Business in the tube market has improved and fair tonnages of galvanized pipe are being sold to the Balkan states and to Yugoslavia at 65 per cent discount off the British standard list. The same countries are also in the market for black pipe and some tonnage has been sold at 75 per cent discount. Lithuania has inquired for galvanized barbed wire. France has ordered railroad cars and locomotives in Germany on reparations account. Some small tonnages of pig iron have been sold to the United States but little significance is attached to these sales in view of the small percentage when compared to the total sales of German pig iron. Apparently participants in the German raw steel union have decided to unify their export prices as it is reported they have fixed the following prices for certain commodities:—ingots 100 marks per metric ton ($23.81); blooms 107.50 marks ($25.50); billets 115 marks ($27.40); sheet bars 120 marks ($28.50); merchant bars 118 marks ($28.10); structural shapes 115 marks ($27.40); sheets 195 to 205 marks ($46.30 to $48.75); wire rods 136 marks ($32.40).

Luxemburg Mills Take Most Pig Iron

Production of Luxemburg iron and steel works in 1924 was 2,173,216 metric tons of pig iron and 1,886,284 metric tons of raw steel against 1,406,666 tons and 1,197,789 tons, respectively, for 1923, Commercial Attache C. L. Jones, Paris, reports to the department of commerce. This production in metric tons was divided as follows:

	1924	1923
Pig Iron		
Basic	2,115,855	1,365,050
Foundry	55,388	37,369
Puddling pig iron	1,973	4,247
Raw Steel		
Thomas Steel	1,857,965	1,170,707
Open-hearth Steel	22,036	22,763
Electric Steel	2,283	4,269

While pig iron production in 1924 was only 85 per cent of that of 1913, the manufacture of steel was 100.2 per cent of that of before the war. The 1924 statistics show an increasing disproportion between production of pig iron and steel. This is because steel mills, in order to realize a more complete program of finished products, are now absorbing most of the pig iron produced by the blast furnaces, and merchant iron is being restricted.

Machinery

March Business Considerably Better Than That of February Although Slowing Down During Last of Month Is Noted

PURCHASES of machine tools tapered off during the past week, this tendency being noted in practically all important centers. Inquiries also fell off with the result there is little upon which to base the future trend of business. Despite the decreased sales of the last few days, March, in nearly all cases, showed a volume considerably better than that of February. Railroad inquiries continue to hold the interest of manufacturers and dealers. During the past week the Chicago, Burlington & Quincy railroad issued a list calling for 40 miscellaneous tools. Several eastern railroads which have had lists out for some time are showing more disposition to close. Crane buying again has passed a listless week. Few sales were made and relatively few projects are pending. Locomotive cranes are more active than other types.

New York, March 31.—Some eastern railroads with tool lists pending now are showing indications of closing. The Central of Georgia, is understood to be deciding on the disposition of its list of possibly 20 machines this week, while the Lackawanna is expected to close on the greater portion of its list within the next few days. The Virginian railway also is likely to close soon. Little interest, however, is being manifested by the Chesapeake & Ohio and the Lehigh Valley railroads. The Pennsylvania railroad is inquiring for several machines for Altoona, Pa., including a 20-inch upright drill, 5-foot radial drill and a combination punch and shear. The Florida East Coast has closed on a 79-inch driving wheel lathe, while the American Car & Foundry, New York, has purchased a 400-pound hydraulic wheel press. Sanderson & Porter, New York, purchased a 600-pound steam hammer and the Welsbach Co., Gloucester, N. J., is closing on four or five miscellaneous machines. Likely buyers are John E. Thropp & Sons, Trenton, N. J., who are now figuring on several hundred tons of structural steel for a machine shop. Featuring the crane market is an inquiry from the New York Central railroad for six 25-ton locomotive cranes and four ditchers.

Boston, March 31.—March tool sales declined as compared with February. More orders were received but were of smaller nature. Several technical schools have received bids against lists but no orders have been placed. The Boston & Albany railroad is inquiring for a large milling machine and the list of tools for the New York, New Haven & Hartford railroad which has been out since the first of the year is now more active. While inquiry does not include any large lists, its more diversified nature is encouraging.

Pittsburgh, March 31.—Crane and machine tool business has been limited although additional cranes are scheduled to be purchased within the next day or two by the Carnegie Steel Co. for Homestead. Its other crane inquiries for Duquesne and Mingo Junction are becoming more active. The Pittsburgh Plate Glass Co.'s new plant at Creighton, Pa., will require several large cranes. Tool sales and inquiries are nominal, confined mostly to single items. The Westinghouse Electric & Mfg. Co. bought a 62-inch and a 72-inch boring mill for East Pittsburgh, a motor-driven saw for Sharon, and another motor-driven saw for Homewood. The Pennsylvania railroad has added two or three tools to its list, and bids were opened March 26 on the Virginian railway's list. The Chesapeake & Ohio railroad machines for Richmond, Va., are understood to have been bought in Philadelphia.

Burlington Tool List

AT CHICAGO

16-inch geared head engine lathe, 48 inches between centers. Motor driven.
18-inch geared head engine lathe, 48 inches between centers. Motor driven.
Double end car axle lathe, swing over bed 27½ inches, over carriage 13¾ inches, distance between centers 9 feet. Belt driven.
48 x 48-inch x 18-foot planer, with two heads on cross rail and two side heads equipped with variable speed reversing motor, direct connected.
36-inch heavy duty shaper. Motor driven.
Horizontal boring mill, with one 3 and one 4-inch boring bar, 120 inches between face plate and arbor support, equipped with 16-inch face milling cutter. Motor driven.
Two belt-driven car wheel boring mills with

(*Concluded on Page 921*)

Crane Orders Placed

Single crane orders included a ditcher for the Delaware & Hudson railroad to American Hoist & Derrick Co., also a 10-ton locomotive crane to Brown Hoisting Machinery Co. (Delaware & Hudson originally was in the market for two 20-ton locomotive cranes but action has been abandoned); ditcher for Cincinnati, Indianapolis & Western railroad to American Hoist & Derrick Co.; 10-ton electric overhead crane for Craig Ridway & Son Co., Philadelphia, to Alfred Box & Co.; 10-ton crawling tractor crane for Berkebile Bros., Johnstown, Pa., awarded to North West Engineering Co.

Crane Orders Pending

Crane orders pending include: Large number of cranes for Carnegie Steel Co., Homestead, Pa., several additional units to be placed this week; several cranes for the same interest at Duquesne, Pa., progress being made in specifications; several cranes for Mingo Junction, O., plant of same interest, proposition delayed pending working out of engineering problems; several cranes for Pittsburgh Plate Glass Co., Creighton, Pa., new $5,000,000 plant to be erected; six 25-ton locomotive cranes and four ditchers for New York Central railroad, bids asked. Four 25-ton locomotive cranes for Baltimore & Ohio, pending, original inquiry called for six; 10-ton electric overhead crane for Schenectady, N. Y., plant of General Electric Co., bids asked; electric crane for Pitcairn, Pa., shops of Pennsylvania railroad, bids asked.

Cleveland, March 31.—Business has slowed up slightly during the last few days, nevertheless, the volume of sales was in nearly all cases in excess of that of February. Little can be predicted as to the future. A cheerful tone continues to exist indicating that a gradual improvement might be expected. The Hudson Motor Car Co., Detroit, last week purchased approximately $400,000 worth of machine tool equipment, the business being divided between several dealers in this territory. The F. J. Lamb Co., Detroit, is in the market for a vertical boring mill and a large power punch press.

Chicago, March 31.—The machine tool market would be lifeless without railroad inquiry. Industrial users are occasional buyers but are not sufficient to maintain a live market. Dealers all hope for speedy action on the 60 machine tools for which the Illinois Central railroad inquired a month ago. The Chicago Burlington & Quincy railroad has issued a list of more than 40 tools, given in detail on this page. The Santa Fe railroad has augmented its inquiry by a 54-inch vertical heavy duty boring mill, 16-inch x 10-foot heavy duty type engine lathe, a 20-inch x 8-foot heavy duty engine lathe and one 2½-inch double head cutter for bolts.

Cincinnati March 31.—Sales have not improved noticeably during the month but a better sentiment is apparent. Manufacturers and dealers find scattered orders, which show a better total each week than a year ago. Small tool demand is more active. The G. A. Gray Co., placed orders for two 20-ton and one 15-ton cranes with the Harnischfeger Corp. for its new machine shop under construction. Concinnati Planer Co., received an order for a 42-inch planer from the American Steel Foundries, St. Louis, and another from the Textile Machine Co., Reading, Pa., for a 36-inch machine. Inquiries are appearing in larger volume than for several weeks.

The Detroit Electric Furnace Co., Detroit, has given to the University of Michigan a large standard electric furnace. The unit, which now is being installed, will be used in research work in the melting of cast iron, steel and nonferrous metals.

Rates Compromised

Agreement Reached on Freight Tariffs on Middle Ground

Chicago, March 31.—Differences between railroads and shippers in western trunk line territory arising from the attempt of railroads to increase class rates, Jan. 31 from Indiana and Illinois points to the Twin Cities and to Missouri river points appear to have been adjusted by a compromise proposed by W. V. Hardie, director of the bureau of traffic of the interstate commerce commission.

Mr. Hardie's recommendations, embracing commodity as well as class rates and looking to co-operative action by railroads and shippers to adjust all western trunk line rate difficulties, were approved, with minor modifications, at a meeting of more than 400 shippers here. Between Chicago and the Twin Cities Mr. Hardie recommended that the present 98-cent first-class rate be substantially maintained. The class per cents are to be: First, 100; second, 85; third, 70; fourth, 50; fifth, 35; A, 40; B, 32.5; C, 28; D, 22.5; and E, 20. These per cents generally are a slight advance in fourth and fifth class rates, fourth class embracing less-carload and fifth class railroad carload iron and steel shipments.

From Chicago and Milwaukee the Hardie recommendation for fourth class is 49 cents and for fifth class 34½ cents; this is an increase of 8 cents in the fourth class rate and 4 cents in the fifth, but less than half the advance sought by the carriers. From Peoria, Ill., to the Twin Cities the suggested fourth class rate is 49 cents and fifth class, 34½ cents; from St. Louis 62½ cents for fourth class and 44 cents for fifth.

From Chicago and Milwaukee to Kansas City and St. Joseph, Mo., the Hardie fourth class recommendation is 60 cents and fifth class 42 cents. From Peoria the fourth class recommendation is 53 cents and fifth class 37 cents. From St. Louis it is proposed to make fourth class 46 cents and fifth class 32 cents. From Chicago and Milwaukee to Omaha, Mr. Hardie would have the fourth class rate 60 cents and fifth class 42 cents; from Peoria fourth class 53 cents and fifth 37 cents and from St. Louis fourth class 46 cents and fifth class 32 cents.

Mr. Hardie recommended further:

"Carriers and shippers agree to enter at once into negotiations leading to a permanent adjustment of the whole situation here covered, together with points east and west of the territory here covered as may be necessary to bring about a comprehensive adjustment, particularly points in Nebraska, Kansas, the Dakotas, and Minnesota; bringing into such negotiations not only the shippers and receivers, but such shippers as may be interested in the broader readjustment, and further agree to advise the commission not later than May 15 of the progress made, the likelihood of final agreement and apparent further time during which such negotiations should continue in hope of reaching agreement."

Join Pittsburgh Plants In Piping Merger

Pittsburgh, March 31.—Under the name of the Pittsburgh Piping & Equipment Co., the American Foundry & Construction Co. has been merged with the former Pittsburgh Piping & Equipment Co., with a combined capital of $3,000,000. These two companies have taken an active part in the development from the comparatively low pressure power plant piping of 20 years ago, to the high specialized era of high pressure of the superpower plants of today. The officers of the merged companies are: President and general manager, George H. Danner; vice president, Morgan B. Schiller; vice president and treasurer, Charles R. Rall; secretary W. R. Neely; and general manager of sales, Robert Whyte. Irvin G. Miles and Oliver J. Haller also will be associated with the new company.

The Pittsburgh Piping & Equipment Co. was organized in 1903 by a group of Pittsburgh business men, who have been identified with it ever since. The officers were: George H. Danner, president and general manager; Charles R. Rall, vice president and treasurer, and W. R. Neely, secretary.

The American Foundry & Construction Co. was incorporated in 1902. Its officers were: President and general manager, Morgan B. Schiller vice president and manager of sales, Robert Whyte; secretary and treasurer, Irwin G. Miles; and Oliver J. Haller, mechanical engineer and general superintendent.

Announcement was made that the Hazelwood plant of the American Foundry & Construction Co. will be abandoned gradually as will be the old works of the Pittsburgh Piping & Equipment Co. at Thirty-fifth and Charlotte streets. Fabricating and manufacturing of the consolidated companies will be carried on at a new plant in operation at Forty-third street and the Allegheny Valley railroad.

Places Mill Equipment

Practically $800,000 is involved in the 28-inch and 32-inch structural mill table and auxiliary mill equipment purchased by the Carnegie Steel Co. for Homestead, 75 per cent of the order going to one Alliance, O. manufacturer and the remainder going to the other. About 5,500,000 pounds of steel castings are involved in the two orders.

March Pig Iron

Production Rate Shows Slight Change Over February—Stocks Decline

Production of pig iron during March was at about the same rate as in February, according to a preliminary estimate prepared by IRON TRADE REVIEW. This estimate is based on reports received from a number of blast furnaces which during January and February produced 73 per cent of the country's total of pig iron. On this basis, it is estimated that the total output of pig iron in March was 3,590,000 gross tons, a figure which is greater than the 3,214,067 tons of the preceding month by about 376,000 tons. February was a 28-day month as compared with the 31-day month just passed.

The estimated total indicates that during March iron was made at the rate of 115,700 tons per day, a figure which exceeds the 114,788-ton rate of February by about 1000 tons per day. The companies which reported their productions for March operate 223 of the country's 410 blast furnaces and on March 31 had 168 active as against 173 on Feb. 28 and 170 on Jan. 31.

Complete returns of pig iron production and blast furnace operations will appear in next week's issue of IRON TRADE REVIEW. Brief returns for the last three months, however, with March estimated, are as follows:

	*March	Feb.	Jan.
Total production, gross tons	3,590,000	3,214,067	3,372,207
Average daily production, gross tons	115,700	114,788	108,781
Furnaces operating, last day of month	256		251

*Estimated from partial returns.

Gas Engine Makers Form World Sales Body

Gas engine manufacturers have formed an organization as a department of the National Association of Farm Equipment Manufacturers, Chicago, to promote the sale of American-made gas engines. E. D. Sawyer of the Cushman Motor Works, Lincoln, Neb., was elected chairman, M. A. Zteele of the Stover Mfg. & Engine Co., Freeport, Ill., vice chairman and F. H. Edson of the John Lanson Mfg. Co., New Holstein, Wis., was chosen secretary.

Statistics are being gathered by the bureau of foreign and domestic commerce to determine the potential absorptive power of foreign countries as related to gas engines.

The Harbison-Walker Refractories Co. reports net profit of $4,171,398 for 1924, against $4,358,708 in the previous year.

Committees of Testing Society

Report Progress of Work

Members of Eleven Main Committees Give Present Status of Investigations and Recommend Specifications and Questions of Policy for Action at Annual Meeting of Society in June — Meeting Well Attended

MEETINGS of 11 committees of the American Society for Testing Materials, constituting the metals section of the society, were held at the Bellevue-Stratford hotel, Philadelphia, Wednesday, Thursday and Friday, March 18, 19 and 20. They were attended by about 200 members and visitors.

Committee A-4 on the heat treatment of iron and steel, with H. M. Boylston, Case School of Applied Science, Cleveland, as chairman, and J. H. Hall, Taylor-Wharton Iron & Steel Co., High Bridge, N. J., as secretary adopted and will propose to the society at the annual meeting in June an extensive revision of the society's recommended practice for heat treatment of case hardened carbon-steel objects. The present recommended practice has stood without revision for about 10 years and the revision has taken the form of a rewriting of the recommended practice. Particular attention has been paid to the details of procedure and the precautions to be observed. The revised recommended practice will also include valuable tabulation of defects that may occur in case-hardened objects, with a discussion of the reasons therefor and means of avoiding them.

Some time ago definitions of terms relating to heat treatment tentatively prepared by the American Society for Steel Treating were referred by that society to the American Society for Testing Materials for review. This review has taken the form of a critical study of the definitions by committee A-4, and at the meeting on Wednesday a report was adopted for transmission to the American Society for Steel Treating commenting upon these definitions. The committee has recommended to the executive committee of the society the formation of a joint committe of the American Society for Steel Treating, American Society for Testing Materials and the Society of Automotive Engineers for the preparation of a series of standard definitions of terms relating to heat treatment, and this recommendation will be acted upon by the executive committee of the society next month.

Committee A-2 on wrought iron held a well attended meeting at which reports were received from the various subcommittees. The specifications for welded wrought iron pipe were under discussion and some minor revisions were proposed, with special reference to butt-welded pipe. Active work is being carried on in the committee in connection with chemical analysis of bar iron. Work has been completed on the methods of determining carbon, manganese, sulphur and phosphorus in wrought iron and substantial progress was reported in methods of analysis for silicon and slag in wrought iron.

At a meeting on Thursday the joint committee on the effect of temperature on the properties of metals discussed details of its test program and methods of financing the committee's work. The committee will invite the co-operation of a number of laboratories in conducting the tests. Committee E-4 on metallurgy discussed the recent development in the study of metals by the use of the X-ray in which the value of this method of analysis in studying the nature and arrangement of the minute constituents of metals was emphasized. A subcommittee under Dr. Zay Jeffries, Aluminum Co. of America is engaged in the preparation of recommended practice for making such examinations. Another subcommittee under W. E. Ruder, General Electric Co. reported recommended practice for thermal analysis of steel which the committee has accepted for presentation in June.

To Tabulate Iron Use

At the meeting of Committee A-3 on cast iron Dr. Richard Moldenke, chairman, reported results of his recent visit to England, France and Germany in which he had made a study of international methods of testing cast iron in various forms. In connection with the matter of specifications for pig iron, the committee plans a study and tabulation of existing practice in the use of various compositions of pig iron for different grades of castings.

A report was received by committee A-5 on the corrosion of iron and steel of the inspection of the uncoated metal sheets still exposed at Annapolis, Md., and Fort Sheridan, Ill., upon which reports have been presented annually before the society for a number of years. Only one additional failure has been reported at Fort Sheridan and none at Annapolis. Deterioration seems to be proceeding in the relative order in which the corresponding sheets failed at the Pittsburgh location, as reported in recent years.

At its meeting the committee received a comprehensive report from the subcommittee on field tests of metallic coatings. A program was adopted which involves the following main features:

1. Exposure of material to be tested at five strategic localities.
2. Chemical and physical analysis of samples of the material exposed.
3. A study of accelerated corrosion tests with the object of finding that method which will most nearly check long-time exposure results, and applying such method as a parallel series of tests on the metallic soated rpdoucts to be subjected to atmospheric exposure.

The products to be exposed are galvanized sheets, galvanized wire, galvanized fencing, structural shapes, hardware, pole line material, tubes, castings, and lead and terne plate.

Substantial progress was reported on the program for structural shapes, hardware, pole line material, tubes and castings, each of which are to be tested with the following coatings: Hot dip galvanizing, sherardizing, electro zinc plating, cadmium plating, sprayed zinc, aluminum dip, calorizing and lead dip. Progress was also reported on the program for exposure of lead and terne plate.

Committee A-1 on steel at a meeting on Friday reviewed the work of its subcommittees during the past year. A. W. Carpenter, chairman of the subcommittee on structural steel, submitted for the subcommittee proposed tentative specifications for structural silicon steel. It is felt that the use of silicon steel has reached a point that justifies the publication of specifications, and after considerable discussion the specifications were accepted by the committee and will be submitted to the society in June for adoption as tentative.

The subcommittee on pipe flanges and fittings submitted proposed tentative specifications for carbon steel castings for valves, flanges and fittings for high temperature service up to and including 750 degrees Fahr.; and proposed tentative specifications for alloy steel bolting for the same service. These were adopted by committee A-1 as proposed tentative standards for submission to letter ballot of the committee, and if passed will go before the society in June.

Selling Abroad

Discussed By Export Managers—Good Opportunity in Cuba

About $7,500,000 worth of available business in power equipment is awaiting American electrical manufacturers in Cuba in meeting the needs of that country's electrically operated sugar mills, Loren Emery, assistant general merchandising manager, International General Electric Co., told members of the Export Managers club last week. Several hundred members from various cities attended the club's annual meeting in New York.

"Cuba," said Mr. Emery, "presents every facility for the average American producer or manufacturer, provided his goods are saleable. Probably the chief reason for the less satisfactory profits on sales in Cuba as compared with sales within the United States is our supersensitiveness to price competition when we are not thoroughly acquainted with its character. Experience has led me to believe that any company doing a business of, say $150,000 or more in Cuba, can pay the expense of its own local representative by the additional profits it will obtain due to a better understanding of the market."

In discussing "Building Sales Through Known Facts," Mr. Emery pointed out that the cardinal principles underlying the development of new business are: The worthwhile markets must be determined; buying habits of these markets must be studied; channels of approach to these buyers must be selected, and the strongest possible appeal to the buyer must be made.

The importance of securing adequate information concerning foreign customers if credit losses are to be avoided was discussed by A. B. Dod, export credit manager, Merck & Co. Mr. Dod said he had found it possible to secure such information successfully through local representatives of American firms on the scene, then checking this information through the credit managers of local foreign banking institutions. He mentioned the service being rendered by the Foreign Credit Interchange bureau of the National Association of Credit Men. Reasonable credit losses may often be made a contributing factor in increasing sales, Mr. Dod said.

The methods used by the General Motors Export Co. in analyzing its foreign markets was described by Louis A. C. de la Garde of that company. The firm uses two chief methods, Mr. de la Garde explained, the first being so-called "home office" surveys of world markets, and the second, market analyses conducted by field men on the spot.

W. L. Bomer, export manager, Bristol-Myers Co., pointed out the advantages of so preparing the sales representative for his field work that he may be permitted to exercise his own judgment to a greater degree than is often the case.

The plan developed by the Remington Typewriter Co. for establishing and building up its markets in foreign countries was outlined by John A. Zellers, foreign sales manager. Using the Remington branch in India as an illustration, Mr. Zellers explained that before this branch was established one of the company's British managers went to that country as a dealer and spent a number of years in developing that market.

"When this distant dealership reached a satisfactory maturity," Mr. Zellers continued, "it was converted into a branch and the former dealer became manager. Whenever this simple and satisfactory arrangement is out of the question, we buy out the dealer on agreeable terms."

An address of welcome to the members of the club was delivered by A. Schoonmaker, its president, and export manager of the Bourne-Fuller Co. W. R. Cummings, vice president in charge of sales, Monroe Calculating Machine Co., presided during the sessions.

Fabricators Meet

Lee H. Miller, chief engineer of the American Institute of Steel Construction, was the principal speaker at the inaugural banquet of the Southern California division of the institute at the Alexandria hotel, Los Angeles, March 19. More than 400 architects, engineers, fabricators and others interested in steel construction attended the meeting. Maynard McFie presided. On the evening of March 24, Mr. Miller was the guest at a joint meeting of the Southern California division of the American Institute of Steel Construction and the recently organized Structural Steel Institute of California. This meeting was held at the Palace hotel, San Francisco.

To Organize Institute on Refractories

Tentative plans are being made for the organization of an American Refractories institute, one of the main purposes of which will be to provide a satisfactory means for contact between representatives from all industries that use and manufacture refractories, in order that various economic and technical problems may be considered and an effort made toward solution. It is proposed also to maintain a research laboratory where outstanding problems will be studied. These problems will concern the consumer as well as the manufacturer.

A meeting is to be held in Pittsburgh April 14, at which time final plans for incorporation of the institute will be discussed. Representatives of industrial concerns using refractories are invited to attend. Macdonald C. Booze, senior incumbent of the Multiple Industrial Fellowship on Refractories, Mellon Institute of Industrial Research, Pittsburgh, has been appointed temporary secretary of the organizing committee.

Otis Makes Changes

Several changes in the official organization of the Otis Steel Co. were made at the annual meeting of the stockholders at Cleveland, March 27. Charles L. Bradley and John Sherwin, Jr. were made directors succeeding P. F. Wilson and J. G. Carruthers, resigned. Mr. Carruthers remains as general manager of sales. R. H. Clark, operating vice president of the Midland Steel Products Co., Cleveland, was elected first vice president to succeed D. T. Croxton. Mr. Wilson continues as second vice president.

Convention Calendar

April 22-23—National Metal Trades association. Annual meeting at Hotel Cleveland, Cleveland. J. E. Nyhan, Peoples Gas building, Chicago, is secretary.

April 22-25—American Welding society. Annual meeting at Engineering Societies building, 29 West Thirty-ninth street, New York. M. M. Kelly, 33 West Thirty-ninth street, New York, is secretary.

April 23-25—American Electrochemical society. Spring meeting at Niagara Falls, N. Y. Dr. Colin G. Fink, Columbia university, New York, is secretary.

April 27-29—National Supply Machinery Distributors' association. Twentieth annual meeting at Ambassador hotel, Atlantic City, N. J. George R. Fernley, 505 Arch street, Philadelphia, is secretary.

April 28-29—Southern Metal Trades association. Annual meeting at St. Anthony hotel, San Antonio, Tex. W. E. Dunn Jr., Healey building, Atlanta, Ga., is secretary.

May 5-7—Southern Supply and Machinery Dealers' association and American Supply and Machinery Manufacturers' association. Joint meeting at Atlanta-Biltmore hotel, Atlanta, Ga. F. D. Mitchell, 1819 Broadway, New York, is secretary-treasurer.

May 6-8—Society of Industrial Engineers. Annual meeting at Hotel Winton, Cleveland. George C. Dent, 608 South Dearborn street, Chicago, is executive secretary.

May 6-9—American Gear Manufacturers' association. Ninth annual meeting at William Penn hotel, Pittsburgh. T. W. Owen, 2443 Prospect avenue, Cleveland, is secretary.

May 7-8—Iron and Steel institute. Spring meeting at Institute of Civil Engineers, London.

May 8-9—American Construction council. Spring meeting at Hotel Biltmore, New York. Dwight L. Hoopingarner, 28 West Forty-fourth street, New York, is executive.

May 18-21—American Society of Mechanical Engineers. Spring meeting at Milwaukee. Calvin W. Rice, 29 West Thirty-ninth street, New York, is secretary.

May 25-28—National Association of Purchasing Agents. Tenth international convention and exposition at auditorium, Milwaukee. W. L. Chandler, Woolworth building, New York, is secretary.

May 28-30—American Society for Steel Treating. Spring sectional meeting at Hotel VanCurler, Schenectady, N. Y. W. H. Eisenman, 4600 Prospect avenue, Cleveland, is secretary.

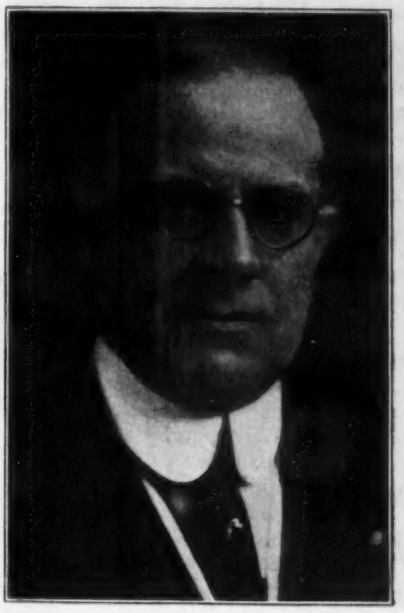
Industrial Men in the Day's News

Alfred G. Smith, New Head of the American Shipbuilding Co.

HIS heritage, his industrial training and his life work are the building of ships for the inland seas.

UNDER his supervision was carried out the government program of shipbuilding on the lakes during the war.

MANY are his accomplishments and achievements in the construction and development of ships.



SHIPBUILDING has been the heritage and the career of Alfred G. Smith, newly elected president of the American Shipbuilding Co., Cleveland. Coming from a family of shipbuilders, Mr. Smith followed the vocation of his father and at an early age entered the industry, to which ever since he has devoted his energies. A practical grasp of the business of building ships and capacity as an executive are the qualities which have won for Mr. Smith steady promotion and advancement. His thorough training and experience in the shipbuilding industry have prepared him by logical sequence to be the head of a great company.

Mr. Smith knows ships, from stem to stern and keel to topmast. His familiarity with construction problems and his ability in solving them, have gained for him the solid backing and loyalty of his organization. Big physically and mentally he personifies uniquely the spirit of his craft and of accomplishment.

Following the footsteps of his father, Mr. Smith started an apprenticeship with the old Globe Iron Works, Cleveland. Mr. Smith's father was connected with that organization until his death in 1903, at which time he occupied the position of superintendent. A brother of Mr. Smith also is in the shipbuilding industry. The Globe plant now constitutes the Cleveland unit of the American Shipbuilding Co.

Identification of Mr. Smith with various plants on the Great Lakes, has made possible for him a wide knowledge of the modes of construction and operation of lake shipyards. At the time of the merger that brought forth the American Shipbuilding Co. in 1899, he was foreman of construction at the plant of the Cleveland Shipbuilding Co. at Lorain, O. He soon returned to the American Shipbuilding organization. Later he went to Buffalo as superintendent of the Buffalo Dry Dock Co., one of the plants of the consolidated company. As his career developed he went to South Chicago, Ill., as general manager of the Chicago Shipbuilding Co., another unit of the American Shipbuilding Co. At the Chicago works in 1905, under Mr. Smith's direction were constructed the W. E. COREY and E. H. GARY, two of the original four boats of the Pittsburgh Steamship Co., and at that time, the largest freighters on the lakes. In 1914 Mr. Smith became general manager of the American Shipbuilding Co. with headquarters in Cleveland. Later he was elected vice president. All during the war he occupied the position of vice president and general manager of the American Shipbuilding Co. As such he was chief directing officer for the carrying out of the larger government program of shipbuilding on the Great Lakes.

During the period of the war, the American Shipbuilding Co. constructed 176 vessels for the shipping board, and 32 on contract for the British government. In addition to governmental contracts the company also constructed eight or ten ships for commercial use. Plants were working day and night, and rapid expansion was the order to accommodate greatly increased activity. Repair shops were developed into production units and 27,000 persons were employed.

With the exception of the period from 1908 to 1914, Mr. Smith has been connected with the American Shipbuilding Co. since it formation. In that period he was associated with his brother under the name of Smith Bros., naval architects, surveyors and appraisers. He is a member of the Society of Naval Architects.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

GEORGE J. HAGAN, founder and formerly president of the George J. Hagan Co., Peoples Bank building, Pittsburgh, has disposed of his interest in that company, and has opened offices in the Peoples Bank building to devote his entire attention to the design and construction of industrial furnaces which have been his specialty for the past 28 years.

* * *

R. H. Schribner has been elected recently a director of the Cleveland Automatic Machine Co., Cleveland.

* * *

Robert W. Simpson, Norristown, Pa., has been appointed superintendent of the upper plate mills of the Central Iron & Steel Co., Harrisburg, Pa.

L. F. Nagle, Pottstown, Pa., has been made assistant general sales manager by that company, of which Robert Hatfield Irons is president.

* * *

Jay Morse Ely has resigned from the sales force of Pickands, Brown & Co., Chicago, and is traveling in Europe.

* * *

H. D. Jenkins, 10 South La Salle street, Chicago, has been made western representative of the Baltimore Tube Co.

* * *

James Hartness, former governor of Vermont and president of the American Engineering council is seriously ill at Boston.

* * *

H. B. Bevan has been appointed district manager at St. Louis for the Buffalo Bolt Co., North Tonawanda, N. Y., to succeed A. M. Jones, who becomes assistant sales manager at North Tonawanda.

* * *

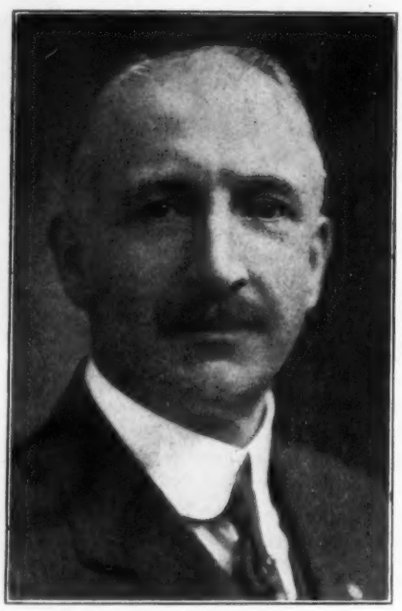
W. W. Cady formerly in the sales department of the Manning Abrasive Co., Inc., Troy, N. Y., has been made Cleveland district manager for the company, with offices at 1414 West Ninth street, Cleveland.

* * *

Robert Bremer, general director of Die Guto Huffnungshuette, an important iron mining property at Essen; Professor Dr. Franz Fischer, director of the Kaiser Wilhelm Institute for Coal Research at Mulheim, Ruhr; Dr. Wilhelmi Funcke, Julius Haack, Alfred Hasebrink, director of mines; Karl Holzer, Dr. Herman Niggemann, coke expert; Hugo Reckmann and Heinrich Unterberg compose a group of prominent figures in the German steel and coal industries who arrived at New York, March 23, to study the coal and iron industry in this country.

* * *

J. P. Lyons, 612 Citizens and Southern Bank building, Atlanta, Ga., has



WILLIAM H. UTZ

Former vice president and European director of Jenkins Bros., Ltd., London, whose appointment as director of sales and member of the board of Jenkins Bros., New York, was announced in the Jan. 29 issue of IRON TRADE REVIEW

been appointed district engineer for the territory contiguous to Atlanta, for the Elwell-Parker Electric Co., Cleveland, manufacturer of electric industrial tractors and trucks.

Andrew C. Duncan, 2835 Washington boulevard, St. Louis, has been appointed district engineer for the territory contiguous to St. Louis, for the Elwell-Parker company.

* * *

O. F. Douglas, just elected secretary and assistant treasurer of the National Acme Co., Cleveland, builder of machine tools, formerly was assistant secretary. Mr. Douglas succeeds N. S. Rathburn, resigned. Mr. Rathburn and W. R. Mitchell have resigned from the board to which Amos Burt Thompson was elected.

* * *

H. B. Miller has resigned as secretary of the Otis Steel Co., Cleveland, after a service of 17 years with that company and has been succeeded by F. G. Oviatt, former assistant secretary. He as yet has made no announcements of his plans for the future. The board of directors of the company adopted appropriate resolutions of appreciation of Mr. Miller's services which is the first time in the history of the company this action has been taken for a retiring officer other than when the latter also was a director.

* * *

Axel Walberg, director of the Jernkontoret, Swedish Iron and Steel Masters association, has arrived in New York, where he is staying at the Hotel Seymour, 50 West Forty-fifth street. Mr. Walberg last was in this country in May, 1924, when he spoke at the banquet of the American Iron and Steel institute. Since that time he has made visits in the interests of the Jernkontoret in Germany, France, England and Spain and other countries and came from Spain to the United States.

* * *

Hays H. Clemens, treasurer of the Hays Mfg. Co., and a director of the Kalbfleisch Corp. and the National Manufacturers association, has been elected president of the Erie City Iron Works, Erie, Pa., to succeed Edward C. Moore, who remains with the Erie City company as vice president and treasurer. Mr. Clemens formerly was secretary of the Erie company.

L. V. Reese, vice president and general manager of the company, has been elected secretary, which position he will hold in addition to those previously held. Mr. Reese, prior to his association with the Erie City company a year ago, was chief engineer for the United States Metals Refining Co. He is well known in the metallurgical, engineering and power equipment fields.

A. R. Horr, vice president of the Cleveland Trust Co., Cleveland; Ely Griswold, vice president of the Griswold Mfg. Co., Erie, and the officers, complete the board of directors for the Erie City Iron Works.

Steel Imports Show Some Gain

February Figures Are Featured by Increased Pig Iron, Ferromanganese and Semi-finished Receipts—Total of 92,380 Tons is the Highest Since March 1923—Exports Drop to 102,302 Tons

PIG IRON imports again dominated the foreign trade of the United States in iron and steel during February, according to data just released by the department of commerce. February pig iron receipts totaled 47,803 tons, as compared with 41,344 tons in January. The 89,147 tons total for the two months comprise over 50 per cent of the total imports for that period. Importation of ferromanganese, manganese metal and alloys in February also was on a heavier scale, reaching a total of 10,342 tons as compared with 6690 tons in January. Total February imports were the largest since March, 1923.

Despite keener competition of German and Belgian steel in the eastern and southwestern districts, imports of structural material decreased from 4315 tons in January to 4008 tons in February. Marked increase was shown in imports of semifinished material consisting of steel ingots, blooms, billets, slabs, etc. Total imports of semifinished in February were 4906 tons as compared with 985 tons in January.

Tubular products also were received in larger quantity in February when 2825 tons was imported, compared with 1002 tons in January. Despite the increase in February that total is below the level of the preceding few months. Other products showing a gain in February over January were ferrosilicon, steel bars, bar iron, round iron and steel wire, wire rope and insulated wire, wire rods and castings and forgings. Those products recording a drop in imports in February were bolts, nuts, rivets and washers; nails and screws; flat wire and strip steel; sheets, skelp and saw plates; boiler and other plates; and rails and splice bars.

Exports dropped from 141,714 tons in January to 102,302 tons in Feb-

IMPORTS AND EXPORTS
Gross Tons

	—1925—		—1924—	
	Imports	Exports	Imports	Exports
Jan.	77,065	141,714	26,677	249,126
Feb.	92,380	102,302	42,277	165,912
March			39,279	124,762
April			50,975	132,739
May			66,806	155,422
June			60,474	172,982
July			30,410	138,845
Aug.			44,928	136,025
Sept.			45,216	135,894
Oct.			40,877	158,553
Nov.			34,300	124,464
Dec.			69,281	129,465
Totals	173,445	244,016	556,281	1,805,064

Year	Imports	Exports
1923	734,734	2,009,141
1922	712,895	2,005,100
1921	135,825	2,150,276
1920	421,274	4,934,087
1919	322,264	4,397,295
1918	169,110	5,338,019
1917	330,201	6,465,053
1916	328,965	6,110,732
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635

ORIGIN OF IRON ORE IMPORTS
Gross Tons

	February		Eight months ended February	
From	1925	1924	1925	1924
Spain	21,925	10,883	80,086	98,065
Sweden	6,918	13,901	248,309	368,328
Canada	149	112	3,357	11,369
Cuba	32,640	35,614	181,688	410,342
Chile	143,400	40,000	849,275	456,100
French Africa	20,400	12,720	146,889	247,868
Other coun.	1,040	1,809	17,653	77,505
Total	226,472	115,039	1,527,257	1,669,577

IRON AND STEEL EXICKTS
Gross Tons

	February		Eight months ended February	
	1925	1924	1925	1924
Scrap	2,659	10,378	32,432	64,357
Pig iron	1,413	4,773	21,071	26,058
Ingots, blooms, billets, slabs and sheet bars	652	710	2,697	339
Steel bars	9,189	8,937	58,637	93,668
Alloy steel bars	155	198	1,575	1,677
Iron bars	287	813	2,432	4,872
Wire rods	1,156	3,565	11,473	32,041
Boiler plates	33	373	1,406	9,497
Other plates not fabricated	6,272	8,282	42,350	55,786
Skelp iron or steel	5,710	7,187	62,875	57,711
Galvanized sheets	15,640	6,227	100,242	65,858
Steel sheets, black	3,575	8,080	77,927	141,196
Iron sheets, black	1,045	565	7,474	8,084
Cold rolled strip	1,106	831	5,520	6,141
Hoops, bands and scroll	1,971	2,892	14,099	17,946
Tin, terne plate	8,051	21,854	90,129	119,488
Structural shapes, plain	7,129	4,809	69,414	68,612
Structural shapes, fab.	1,572	1,032	13,265	23,193
Ship and tank plates, punched and shaped	1,047	179	6,235	1,573
Metal lath	65	154	1,539	1,260
Other structural forms	2,529	3,934	25,035	32,423
Rails over 50 pounds	1,504	26,153	106,3 2	192,605
Rails under 50 pounds	949	1,349	11,519	17,606
Rail joints, splice bars, etc.	235	2,713	7,960	18,921
Switches, frogs, etc.	367	454	4,5?2	4,552
Railroad spikes	357	402	5,057	6,032
Railroad bolts, nuts, washers, etc.	122	168	1,388	1,878
Boiler tubes	704	1,033	7,242	10,849
Casing and oil line pipe	6,574	9,225	43,242	58,168
Welded black pipe	2,659	5,507	36,276	52,812
Welded galvanized pipe	1,487	3,098	24,350	21,529
Malleable iron pipe fittings				4,475*
Malleable iron screw pipe fit.	538	776	6,858	1,237**
Cast iron pipe				8,068*
Cast iron pipe fittings				6,502*
Cast iron screw fittings	275	905	4,753	1,782**
Cast iron pressure pipe and fittings	758	1,099	6,961	2,391**
Cast iron soil pipe fittings	766	286	6,469	500**
Plain iron and steel wire	761	1,779	9,006	25,258
Galvanized wire	1,876	1,961	9,171	29,736
Barbed wire	3,960	5,338	56,166	42,492
Woven wire fencing	241	155	2,257	2,448
Wire cloth and screening	88	87	885	1,520
Wire rope	406	261	2,943	3,322
Insulated wire and cable	34	117	473	925
Other wire	520	810	6,719	8,504
Cut nails	254	158	1,375	977
Wire nails	600	1,385	6,748	37,868
Horseshoe nails	54	71	699	627
Other nails	451	376	3,478	3,589
Bolts, nuts, rivets, etc.	908	1,210	11,453	11,931
Horseshoes	71	176	568	721
Other iron and steel	5,384	5,215	43,472	42,797
Ferromanganese and spiegeleisen	838	2	2,151	2,086
Total	102,302	168,042	1,078,450	1,457,288

*July 1 to Dec. 31
**Jan. 1 to Feb. 28.

DESTINATION OF EXPORTS FOR FEBRUARY
Gross Tons

Countries	Rails	Plates Galvanized sheets	Plates not fabricated	Tin plate	Steel black sheets,	Barbed wire
Argentina	....	7574	....	949	17	591
Australia	....	101	....	....	....	192
Brazil	....	150	....	84	21	592
Brit. South Africa	....	44	....	....	....	668
Canada	277	1965	5521	2603	2607	257
Central America	....	496	3	....	....	278
Chile	271	126	....	92	....	....
China	....	47	....	1862	14	....
Colombia	40	310	....	6	....	184
Cuba	253	732	7	76	52	213
Europe	....	....	....	....	154	....
Honduras	684	....	....	....	....	....
Hong Kong	....	....	....	46	....	....
Italy	....	....	....	663	....	....
Japan	....	1	1	226	604	....
Mexico	178	407	69	341	28	459
Norway	....	206	....	....	....	....
Other countries	203	624	178	667	30	313
Other Europe	....	201	....	....	....	....
Other South America	....	178	....	....	40	23
Philippine Islands	94	2477	....	120	9	124
South America	....	....	493	....	....	....
Spain	300	....	....	....	....	....
Uruguay	....	....	....	262	....	....
Venezuela	....	....	....	54	....	65

FERROALLOY EXPORTS
Gross Tons

	February		Eight months ended February	
	1925	1924	1925	1924
Ferromanganese and spiegeleisen	838	2	2,151	2,086
Tungsten, manganese and other ferroalloys	....	....	....	....
Ferrotungsten, tungsten metal and wire	....	....	1	2
Ferrovanadium	....	....	7	17
Other ferroalloys	131	361	1,521	1,587

CASTINGS AND FORGINGS EXPORTS
Gross Tons

	February		Eight months ended February	
	1925	1924	1925	1924
Iron Castings	921	910	5,629	6,771
Steel Castings	482	677	3,215	3,462
Car wheels and axles	1,109	1,018	14,243	14,624
Iron and steel forgings	173	161	1,012	1,675
Total	2,685	2,766	24,099	26,532

ruary. Marked decreases in a few products largely were responsible for the decline. Shipments of galvanized sheets totaling 28,326 tons in January, featured exports that month. In February this product dropped to 15,640

IRON AND STEEL IMPORTS
Gross Tons

	February		Eight months ending February	
	1925	1924	1925	1924
Pig iron	47,803	15,482	184,180	499,707
Ferromanganese	10,342	2,908	45,126	46,656
Ferrosilicon	656	1,940	5,797	7,440
Scrap	14,502	5,207	65,801	56,181
Steel bars	2,864	.....	5,399*	....
Bar iron	816	314	3,487	4,151
Steel ingots, blooms, billets, etc.	4,906	3,749	22,931	20,807
Structural shapes	4,008	1,016	33,103	9,037
Rails	1,931	4,741	27,773	20,594
Boiler and other plates	22	522	762	2,659
Sheets and saw plates	60	198	1,990	2,384
Tin plates	46	65	232	726
Wire rope and insulated wire	194	90	5,229	649
Wire rods	780	648	3,518	3,910
Tubular products	2,825	4,385	27,253	9,984
Round iron and steel wire	273	402	1,726	2,239
Castings and forgings	231	302	1,585	1,733
Nails and screws	12	26	275	388
Bolts, nuts, rivets, etc.	11	20	94	118
Flat wire and strip steel	98	274	1,109	1,325
Total	92,380	42,289	437,370	690,688

*Steel bars reported separately from Jan. 1, 1925.

ORIGIN OF FERROMANGANESE AND MANGANESE ORE IMPORTS
Gross Tons

Manganese ore from	February, 1925
Canada	35
Brazil	7,989
British India	1,426
Total	9,450
Ferromanganese from:	
Chile	33
France, including Luxemburg	19
Canada	432
Germany	500
Netherlands	40
Norway	1,340
United Kingdom	7,723
Hongkong	255
Total	10,342

IMPORTS OF VARIOUS ORES AND FERROALLOYS

	February		Eight months ended February	
	1925	1924	1925	1924
Ferromanganese	10,342	2,908	45,126	46,656
Ferrosilicon	656	1,940	5,797	7,440
Manganese Ore	9,450	4,430	105,780	144,029
Tungsten Ores	.....	.....	.....	.....
Nickel ore and matte	431	469	3,014	3,919
Total	20,879	9,747	159,717	202,044

ORIGIN OF PIG IRON IMPORTS
Gross Tons

From	February, 1925
Netherlands	9,944
France	98
Germany	9,598
Belgium	1,065
United Kingdom	7,290
Sweden	217
Canada	1,863
British India	17,628
China	100
Total	47,803

tons which still is above normal. Of the latter total 7574 tons went to Argentina, which had taken 20,206 tons the month previously.

Shipments of steel rails dropped from 10,567 tons in January to 2453 tons in February while exports of tin plate, terne plate dropped from 19,416 tons to 8051 tons. Black steel sheets also fell from 9248 tons in January to 3575 tons in February. Exports of semi-finished and iron and steel plates were the only items on the export list showing an appreciable gain in February over Jannuary, the former increasing from 2433 to 6362 tons and the latter from 5095 to 6305 tons.

British India continues to be the largest source of pig iron for American buyers, 17,628 tons coming from that source in February. Netherlands supplied 9944 tons and Germany 9598 tons. This was a decided gain from the Netherlands, which in January shipped 2698 tons to the United States.

Iron ore imports jumped from 174,398 tons in January to 226,472 tons in February. Manganese ore receipts dropped from 12,676 tons in January to 9450 tons in February, although shipments from Brazil increased in that period from 3193 to 7989 tons. Receipts of ferromanganese, featured by 7723 tons from United Kingdom and 1340 tons from Norway, totaled 10,342 tons in February, as compared with 6690 tons for the month preceding.

Despite appearance of foreign cast iron pipe in many American markets, with low price competition as far inland as Detroit, only 1836 tons was imported from Europe in February. Of this total 605 tons came from Belgium, and was received on the Pacific coast, and the rest from France, which went to Massachusetts, New York, and the Pacific coast.

Tubular Imports Into Districts by Countries

Gross Tons

Country	Mass.	New York	Phila.	Galveston	Los Angeles	San Franc.	Total all districts
Tubular tanks							
Belgian Congo	....	218	....	....	....	....	....
Japan	....	13	....	....	....	....	....
Germany	....	14	11	....	....	....	....
United Kingdom	....	6	48	....	....	....	.....
France	....	6	15	....	....	....	391
Cast iron pipe							
Belgium	....	....	....	....	442	163	....
France	713	293	....	....	....	90	1,836
Tubes, pipes, etc.							
Belgium	....	....	....	221	....	....	....
United Kingdom	....	77	....	....	....	....	298
Grand total	....	....	....	....	....	....	2,527

ORIGIN OF PIG IRON IMPORTS AND CUSTOMS DISTRICTS OF RECEIPTS

Origin	Customs District	Gross Tons
Belgium	Massachusetts	1,065
France	Philadelphia	98
Germany	New York	500
Germany	Philadelphia	8,100
Germany	Galveston	998
Netherlands	Massachusetts	7,491
Netherlands	New York	1,100
Netherlands	Philadelphia	1,000
Netherlands	Los Angeles	353
Sweden	Philadelphia	50
Sweden	Maryland	157
Sweden	Washington	30
United Kingdom	Philadelphia	7,240
United Kingdom	Washington	50
Canada	Michigan	1,863
British India	Massachusetts	3,963
British India	New York	1,398
British India	Philadelphia	11,229
British India	Galveston	1,038
China	Hawaii	100
Total		47,803

Exports of Machinery

	February		Eight months ended February	
	1925	1924	1925	1924
Lathes, number	85	50	666	630
Boring and drilling machines, number	110	172	1,575	1,440
Planers, shapers and slotters, number	21	36	184	138
Bending and power presses, number	15	11	255	199
Gear cutters, number	43	16	263	287
Milling machines, number	31	31	371	233
Thread cutting and screw machines, number	41	60	536	468
Punching and shearing machines, number	20	22	115	194
Power hammers, number	30	11	158	256
Rolling machines, number	....	....	....	....
Sharpening and grinding machines, number	....	....	....	....
External grinding machines, number	82	108	1,373	*464
Internal grinding machines, number	10	162	140	*246
Other grinding and sharpening machines, pounds	98,996	60,190	920,610	....
Chucks for machine tools number	1,338	2,354	11,486	21,005
Reamers, cutters, drills and other metalworking tools, pounds	253,365	153,407	1,345,480	1,635,339
Pneumatic portable tools, number	1,079	1,136	9,105	....
Air compressors, number	....	446	*2,780	4,034
Cranes—				
With swinging booms, number	11	3	41	*3
Other cranes, number	10	46	123	140
Hoists and derricks, except, number	271	317	3,558	3,179
Ball and roller bearings, and parts of chains, pounds	82,861	219,615	882,517	1,878,726
Sprockets and power transmission, pounds	113,755	309,022	2,420,271	2,435,895
Other chains, pounds	647,737	750,456	71,654	71,031

*July 1 to Dec. 31.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

OLD COLONY STEEL CORP., 37 West Van Buren street, Chicago, recently incorporated, was formed for the purpose of manufacturing bar mill products. At present it is operating on a conversion contract, buying billets to be rolled into finished forms. As soon as plans can be made a rolling mill will be built. John M. Thomas is president, Elmer E. Stackhouse vice president and Stanley J. Thomas secretary and treasurer.

* * *

MCWAYNE CAST IRON PIPE CO., Birmingham. Ala., will begin operations May 1 in its large plant addition, producing its precalked joint pipe.

* * *

HAYS H. CLEMENS, Erie, Pa., has been elected president of the Erie City Iron Works, Erie, Pa. Edward C. Moore was elected vice president and L. V. Reese secretary and general manager.

* * *

WAUSAU IRON WORKS, Wausau, Wis., has bought equipment of the Wausau Foundry & Machine Co., which recently went out of business, after 35 years existence. The equipment will be moved to the purchaser's plant.

* * *

COLUMBUS TRUCK & SUPPLY MFG. CO., Columbus, Ga., has equipped a gear cutting department, which is now in operation. G. L. Hooks has recently been made general superintendent. James M. Woodruff is president.

* * *

SHIPMENT of 1000 tons of structural steel for a sugar plant in Camaguay province, Cuba, is being completed by the R. I. Ingalls Iron Works Co., Birmingham, Ala. It also has an order in progress for shipment to Brazil and recently shipped an order into Mexico.

* * *

BUFFALO BOLT CO., North Tonawanda, N. Y., manufacturer of bolts, nuts, wire and bar material, has completed an addition to care for threading and milling of jobbing orders. The addition is 75 x 80 feet, equipped with special machinery.

* * *

UNION DRAWN STEEL CO., Beaver Falls, Pa., has exchanged the old plant of the Standard Gauge Steel Co. for the site of the former McCool Tube Co., which was owned by the Pittsburgh & Lake Erie railroad and will build a large warehouse on the property. The railroad company will use the land it acquired for track extensions.

* * *

METALS COATING CO. OF NEW YORK, INC., recently incorporated, with $10,000 capital, will supply New York territory with devices for applying metallic coatings to various surfaces. Arnold V. Schrenk is president and treasurer, William W. Niles vice president and Thomas McErlean secretary, 50 Church street, New York.

* * *

CITIZENS of Stoughton, Wis., have authorized issuance of $100,000 in bonds to finance the purchase of the plant of the Moline Plow Co., originally owned by the Mandt Wagon Co. The plant was closed three years ago. It will be offered to outside industries, being sufficiently large to house several medium-sized concerns in an industrial group.

* * *

INDUSTRIAL CONTROLLER CO., 886 Greenbush street, Milwaukee, Wis., has bought the 3-story industrial building, 100 x 150 feet, South Pierce and Hanover streets, occupied by the Riverside Printing Co., and will move its manufacturing business there. Additional stories will be erected shortly. The present plant on Greenbush street will be sold at once.

* * *

THE Cosmos Steel Corp. has been organized with headquarters at 17 East Forty-fifth street, New York, to do an export and import business in iron and steel. The company is importing Belgian and other European pig iron, bars, shapes, plates and ferroalloys. Otto Kafka is general manager. The officers are chairman, Walter Lissberger; president, George A. Edalenko; treasurer, Henry L. Extein.

* * *

SMITH ENGINEERING WORKS, Milwaukee, Wis., manufacturer of ore, rock and gravel handling machinery, has outgrown its present plant at 1154 Thirty-second street, and has bought a site at Holton street and Lake boulevard, 300 x 300 feet, where a new plant will be built. Worden-Allen Co. has been given a contract for the first unit, a foundry and machine shop 200 x 249 feet. Charles F. Smith is president, treasurer and general manager.

* * *

OFFICERS of the National Acme Co., Cleveland, have been re-elected for the coming year, A. W. Henn, president and treasurer, N. W. Foster vice president and general manager, and D. H. Parker assistant treasurer. N. S. Rathburn resigned as secretary and assistant treasurer and has been succeeded by O. F. Douglas, formerly assistant secretary. Mr. Rathburn and W. R. Mitchell have resigned from the board of directors and Amos Burr Thompson has been elected a director.

* * *

The Carroll-McCreary Co., Inc., Long Island City, N. Y., has been organized with $60,000 capital, to do a jobbing business in steel products. The new company will carry a complete line of sheets, bars, nails, structurals, bolts, etc., and will have its offices and warehouse located at Borden and East avenues. W. J. Carroll, formerly with J. K. Larkin & Co., New York City, is president; B. J. McCleary, formerly of the same company is vice president and Norman Serphos, treasurer.

REYNOLDS ELECTRIC CO., Chicago, has bought the controlling interest in the American Ironing Machine Co., Chicago, from Joseph W. Taft, Elgin, Ill., who retires from the company. William Laib, secretary and treasurer of the electric company has been elected a director of the acquired company. H. G. Gross, Chicago, has been made president; E. C. Peter, Algonquin, Ill., vice president; W. T. Peter, Algonquin, secretary and treasurer, and J. M. Broderick, Chicago, assistant secretary and treasurer. The latter also is comptroller.

* * *

EATON AXLE & SPRING CO., Cleveland, has elected C. I. Ochs president and general manager, succeeding J. O. Eaton, who becomes chairman of the board. Mr. Ochs formerly was vice president and general manager of the axle division, having been connected with the company and its predecessors since 1916. R. C. Enos was re-elected vice president and director of sales and F. A. Buchda was re-elected secretary and treasurer. Fred C. Robie, formerly of the advisory staff of the General Motors Co., has been elected vice president and assistant general manager.

Foote-Burt Takes Over Sensitive Drills

Announcement is made by the Foote-Burt Co., Cleveland, manufacturer of drilling machines and special equipment, that it has purchased the sensitive drilling machine business of the Sipp Machine Co., Paterson, N. J. The latter company is a well known manufacturer of textile machinery. Acquisition of a line of sensitive drilling machines places the Foote-Burt Co. in a position to supply every requirement in drilling machine demand, from drilling small holes with No. 80 drills to extremely heavy work running up to 5 and 6 inches in solid steel. Arrangements now are being made in Cleveland for manufacturing the new line, which expands the company's product to about 16 different types of drilling machines.

The quick change speed sensitive drilling machines are built in three drilling sizes and in single and multiple spindle models. A feature of the line is the quick change speed feature whereby the speed of the drill can be changed in approximately 2 seconds. The machines eliminate the use of a quarter turn belt and are ball bearing throughout. The heavier type can be furnished with power feed to the spindle. To obtain rigidity the machines are built somewhat heavier than usual, the extreme sensitiveness being secured through efficient control mechanism.

G. A. Gray Co. To Build Large Planer Plant

Approximately $500,000 will be expended by the G. A. Gray Co., Cincinnati, manufacturer of metal planers in the construction of a new plant in that city along the right-of-way of the Cincinnati, Lebanon & Northern railroad in Evanston. The Austin Co., Cleveland has the general contract. The plant will consist of two units for the present—machine shop and administrative building. Sufficient ground has been acquired for the erection later of a foundry and other units. Construction of the machine shop and office building will cost approximately $400,000, while another $100,000 will be expended by the company in the purchase of cranes, power and lighting equipment.

The machine shop will be a steel frame structure, 210 by 420 feet. It will contain two main bays, one 60 by 420 feet and the other 50 feet wide and the same length and with alternate high and low bays, 40 feet wide and 100 feet long, which will be built at right angles to the main bays. The office building will be a 2-story brick structure. The foundry will be built in the fall following the completion of the machine shop. Until that time the company will continue to occupy its present plant at Gest and Depot streets, which was built in 1890. The company was founded 65 years ago by G. A. Gray Jr. and was incorporated as the G. A. Gray Co. 45 years ago.

Belgians May Get Steel for Texas Building

New York, March 31.—The largest order which foreign steel sellers now have under negotiation is one for approximately 4600 tons of steel for the new Post-Despatch building at Houston, Tex. As announced in IRON TRADE REVIEW, March 26, this order was booked by the Black Hardware Co., Galveston, whose president, Harry A. Black now is at the Waldorf-Astoria hotel, New York. It first was thought that the steel would go to German makers, but the indications now are that it will go to Belgian mills.

While the sales of foreign steel are not especially active at this time, a fair amount is being sold. The most active sellers at present are the Belgians and a fair amount of French steel also is being imported. Prices on German steel are considerably higher. Consequently German makers are not in the competition here at present. Belgian basic bessemer bars are going at $38 to $39 duty paid tidewater per gross ton, while the prices on open-hearth bars range from $39 to $41. The prices on Belgian shapes are substantially $1 to $2 per ton lower than bar prices.

The Worthington Pump & Machinery Corp., New York, in its annual report for the year ended Dec. 31, 1924 shows net income of $1,177,779 after interest depreciation and federal taxes. This compares with $1,670,850 in 1923.

Obituaries

WARNER M. LEEDS, former third vice president and director of the American Tin Plate Co. prominent in the tin plate industry, and a brother of Charles S. Leeds and of the late William B. Leeds, died March 25 at his home, in New York, aged 57 years. W. M. Leeds' death came at the end of a fight of more than 20 years against tuberculosis, which forced his retirement from active business in 1904.

Born in 1868 in Richmond, Ind., he received his early education at Friends' school in that city, and later graduated from the University of Minnesota. Following a European trip, he became affiliated with his brother William B. Leeds as assistant superintendent at the Elwood, Ind., tin plate plant. Even then his health was such that he was compelled to spend his summers on farms. In 1900 he moved to the New York headquarters of the American Tin Plate Co., the outgrowth of the Elwood works, being associated at that time with Daniel G. Reid and William R. Graham. For several years he was a director of the American Can Co.

* * *

Elzy B. Van Atta, president and founder of E. B. VanAtta & Co., Inc., Olean, N. Y., manufacturer of hydraulic presses, died March 19 at the age of 67 years. Mr. Van Atta established a plant in 1916 at Olean, where he went from New York. He was a native of Ohio and a former vice president of the Hydraulic Press Mfg. Co., Mount Gilead, O., where he advanced from a salesman to officer and partner.

* * *

Harry B. Duncan, aged 62, president and director of the Universal Steel Co., Bridgeville, Pa., and a prominent business man of Washington, Pa., died March 27. He was born in Pittsburgh, April 19, 1863.

* * *

Horace W. Fuller, president of Fuller Bros. & Co., New York, up to his retirement a year ago, died March 23, at his home in that city at the age of 86. This company long has been known as a jobber of nails, wire and other iron and steel products.

* * *

Walter P. French, aged 50, treasurer and director of E. J. Lavino & Co., Philadelphia, producers of ferromanganese, died suddenly in that city March 25 from pneumonia. He formerly was connected with the Girard National bank, Philadelphia, but nine or ten years ago became treasurer for the Lavino company.

* * *

John Luther Nicholson, president of the Locomotive Firebox Co., Chicago, and inventor of several locomotive attachments, died at his home there March 23. Mr. Nicholson was born in New York and started in business in 1895 with the Chicago & Northwestern railway.

Build Machine Tools for High Production

(*Continued from Page* 883)

each end of the platen ride to support the overhang. A centralized control of all levers gives feeds, speeds and hand control. One conveniently located lever controls revolving of the main boring spindle in either direction. The machine is equipped with an interlocking device for quick travel and power feed. Spindles on the feed and speed boxes run in roller bearings. The head, feed and speed boxes are enclosed and run in oil, a continuous gravity oiling system being provided.

A jig boring machine built by the Pratt & Whitney Co., recently has been redesigned to add rigidity necessary for the extremely accurate boring which the machine is required to do. This machine, which is described as No. 65, has an entirely new column made heavier to withstand vibrational strains. The column head has been changed to conform to the new column. A further improvement is the redesigned spindle speed gear box which because of its reduction in size has added strength to the drive and decreased the required floor space of the machine. The spindle head has been made larger and heavier and has been given a much greater bearing surface on the column face.

Measuring devices for the transverse and longitudinal movements of the table are the most important parts of the tool. The table, which is rectangular in shape, is equipped with transverse and longitudinal slides, each of which is, traversed by a screw having a slow motion as well as a rapid traverse handwheel. Each slide is equipped with a measuring device consisting of a combination of end measures, an inside micrometer and an indicator dial. The end measures give even inches, the inside micrometer reads to 0.001 inch and the indicator dial to 0.0001 inch. In this way, after having established the spindle of the machine over the first hole to be bored by means of either a proving bar or a button, it is easy to move to the next hole by means of the right-angle dimensions.

Drive Prevents Overloading

To limit the available power so that accuracy of the machine can not be damaged by heavy strains due to overloading, the drive to the spindle is through a belt. There are eight spindle speeds ranging from 22.2 to 300 revolutions per minute, while the feed gear box gives four feeds.

An interesting machine is described in No. 77 of the digest. It is of foreign manufacture and is being introduced in this country by F. W. Jaeger, New York. Essentially the machine is four standard tools combined into one. Work which can be performed includes turning, drilling, milling and shaping, and any of the latter three operations can be done simultaneous with turning. In addition to the general starting and stopping lever for the whole machine, each unit has its individual control levers. Interfering motions are interlocked.

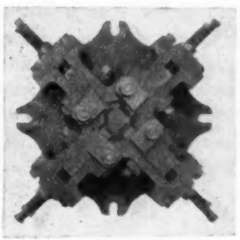
Three new grinding machines were brought out during the month. One, described as No. 63, and built by the Landis Tool Co. was designed specially for grinding automobile brake drums. The advent of four-wheel brakes as well as the tendency to use higher carbon steel in drum construction has created a demand for this machine. Since some drums must be finished on the outside and others on the inside, two models of the machine are available. Inasmuch as the machine set-up remains the same on work of this kind, the machine is a high production unit.

Another grinder introduced in March was a vertical centerless grinder built by the Detroit Machine Tool Co. and described as No. 64. It is a redesign of a former model and incorporates a number of new features, as regards feed-

Machine Accommodates Bar Turning

No. 66

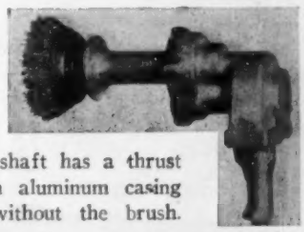
The Brightman Bros. Co., Columbus, O., has introduced a new design of its machine for turning bar steel, alloy bars and tubing. It is built in three sizes, having capacities of ½ to 2, 1 to 4 and 2 to 6 inches, respectively. Spindle speed from 45 to 345 revolutions per minute are available. A crane is provided for lifting cutting heads in and out of the machine. The illustration shows the cutting head used. It will accommodate one, two or four tools.



Air Motor Operates Wire Brushes

No. 68

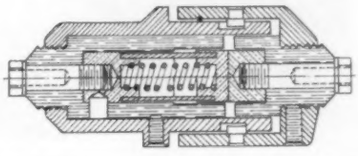
The Standard Turbine Corp., Scio, N. Y., has developed a light-weight pneumatic motor for operating wire brushes used in cleaning steel blooms, steel castings, etc. The motor consists of a turbine wheel rotating at a speed of 12,000 to 18,000 revolutions per minute. It is ball bearing mounted and geared with single or double reduction to the low speed shaft on which is mounted the brush. The latter shaft has a thrust bearing. The unit has an aluminum casing and weighs 9½ pounds without the brush.



Cable Connector Made Waterproof

No. 67

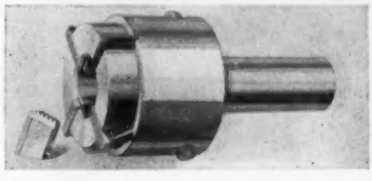
The Ohio Electric & Controller Co., Cleveland, announces the design of an armored, weatherproof electric cable connector that can be connected or disconnected instantly without tools. It will carry 150 amperes continuously, a current ample for any lifting magnet and the majority of motors. A double bayonet lock holds the connector together. Butt contacts are secured by a 20-pound spring pressure and the contacts are protected when the connector is open. The wipe cleans the contacts.



Die Head of Simple Construction

No. 69

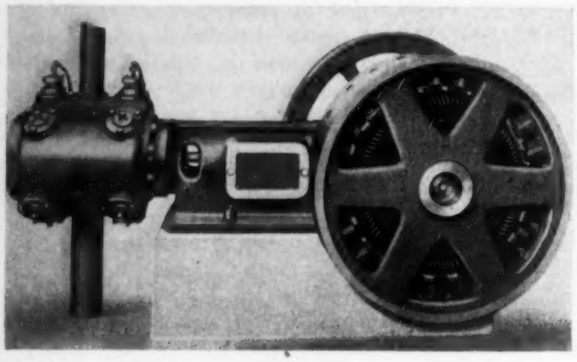
The Geometric Tool Co., New Haven, Conn., has placed on the market a rotary, self-opening die head designed particularly for multiple spindle automatics and other live spindle machines. These heads are of small diameter and consist of three units completely enclosed. Opening and closing of the head is by the forward and backward movement. The chasers project beyond the face of the head to facilitate thread cutting.



Flywheel Motor Runs Compressor

No. 70

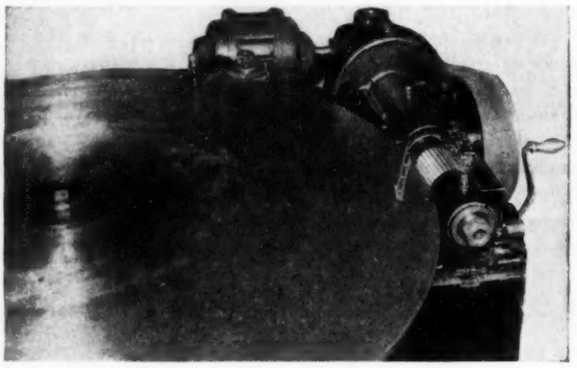
The Chicago Pneumatic Tool Co., New York, has applied to its line of air compressors a new direct-connected flywheel type synchronous motor. Although slow-speed, direct-connected synchronous motors have been used on large capacity compressors for some time design difficulties have retarded the application of this type of motor to compressors of smaller capacities. General standard construction of synchronous motors has necessitated large diameters for slow speed. To overcome this disadvantage the flywheel type motor was developed. The rotating element is placed outside the stator which is mounted in a cradle support bolted to the compressor frame. The rotor has the appearance of an ordinary flywheel and is crowned for driving an exciter or other auxiliary while on the inside are mounted the poles.



Machine Reconditions Saw Blades

No. 72

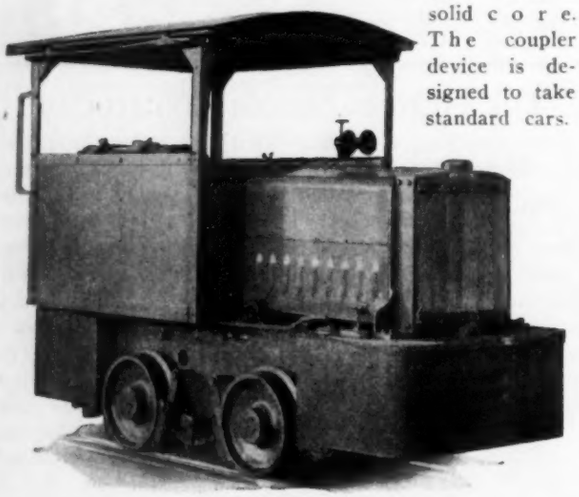
Joseph T. Ryerson & Son, Inc., Chicago, has designed a machine for reconditioning friction saw blades. Formerly blades were sharpened by forming teeth in the periphery with a hammer and cold chisel, a method not satisfactory. The new machine consists primarily of a centering and leveling frame which holds the blade horizontal while a milling and serrating hob applied to the edge of the blade revolves it and at the same time mills the desired grooves, trimming the rim so that the periphery is left true. At another point on the circumference of the blade a pair of milling cutters removes the slight mushroom effect from both sides. The hob and milling cutters used will form teeth in any standard blade regardless of hardness. The work is performed quickly and teeth are cut according to specified size and spaced evenly.



Locomotive Provides Heavy Pull

No. 71

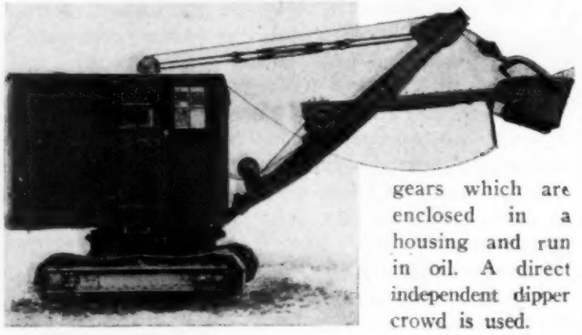
The Geo. D. Whitcomb Co., Rochelle, Ill., has brought out a 4-ton gasoline-operated industrial locomotive which is built in all track gages to meet the conditions of service. It is built upon a solid cast iron chassis, weighs approximately 8000 pounds and has an average draw bar pull of 1600 pounds. Coil springs are provided on each journal box to effect an easy riding action. Power is supplied by a 4-cylinder gasoline engine developing from 30 to 48 horsepower. The radiator is of the artillery type with removable sections which in case of damage may be replaced or filled with a solid core. The coupler device is designed to take standard cars.



Creeper Crane Turns as on Pivot

No. 73

The Brown Hoisting Machinery Co., Cleveland, has just announced a new ½-yard capacity, gasoline engine, creeper truck shovel crane, features of which are its simplicity and accessibility of parts, its pivot steering device, rapid operating speeds and quick convertibility to dipper shovel or clamshell work. In turning, power is applied equally to both creeper belts, but the creepers are run in opposite directions. In this way the creepers simply change places and the machine pivots around on one point. Steering is accomplished from the operator's position and without swinging the boom. Three gears are used below deck for steering and traveling. The entire crane has only 18 gears, a fact which enables them to be made wider and of larger diameter. As a shovel or crane the machine has rapid operating speeds but all moving parts are slow running except the engine takeoff gears which are enclosed in a housing and run in oil. A direct independent dipper crowd is used.



ing and grinding the work. The third grinder announced last month was a universal and tool grinder designed by the Oesterlein Machine Co. It is described as No. 76. It is intended primarily for use in railroad and automobile shops for grinding gang reamers, borings bars bridge reamers, taps and similar tools. Large capacity, versatility of application and rapid manipulation are features.

For use in full finish sheet mills and also for use on jobbing mills where sheets are leveled directly off the mill, the Aetna Foundry & Machine Co., has developed a new roller leveler. It is described as No. 58. The principal feature in design is the application of a newly developed universal coupling which drives the rolls. It is claimed that the tendency to chatter and to chatter mark sheets has been overcome.

The Hunter Saw & Machine Co. has announced a new high speed metal cut-off saw which operates cold. It is described as No. 60 in the digest. The unit was designed to cut small light section beams, channels, angles, tubing and similar material. The saw and motor are mounted on opposite ends of a tilting frame, the motor driving the saw at a peripheral speed of from 18,000 to 20,000 feet per minute.

Up to this time friction saw blades have been sharpened by forming teeth in the periphery of the blade with a hammer and cold chisel. As a result the blade seldom was nicked uniformly and, in addition, the metal was displaced so as to thicken the edge of the saw. Fissures resulting from the chipping frequently caused blade failures. To overcome this Joseph T. Ryerson & Son, Inc., has developed a machine for doing the reconditioning work in a satisfactory manner. It is described as No. 72. The saw blade is held flat and is revolved by a milling and serrating hob which mills the desired grooves and at the same time trims the rim so that the periphery is left true. At another point on the circumference of the blade, a pair of milling cutters removes the mushroom effect from both of the sides of the blade. The machine cuts teeth of any size and spacing specified.

Burlington Tool List

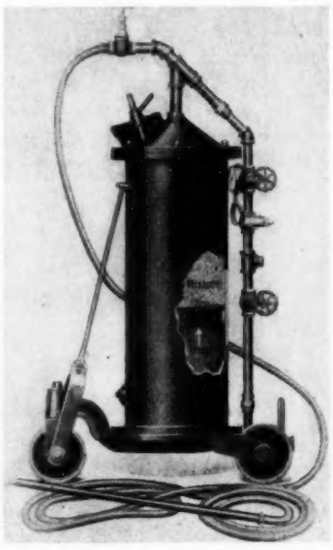
(*Concluded from Page* 909)

54-inch diameter table to take wheels up to 48 inches in diameter.
54-inch adjustable rotary milling machine with two sets of ways at right angles, 40 x 46 inches over the shears. Motor driven.
20-inch upright drill, 1¼-inch capacity, with automatic feed. Motor driven.
Pneumatic flanging machine for flanging sheets up to and including ¾-inch.
Bending machine for bending square bars up to 1¼-inch.
400-ton belt-driven hydraulic horizontal type wheel press.
24-inch geared head engine lathe, 72 inches between centers. Arranged for motor belt drive.
16-inch portable engine lathe, 36 inches between centers. Arranged for motor belt drive.
20-inch geared head turret lathe. Arranged for motor belt drive.
32-inch heavy duty pattern back geared crank shaper. Motor driven.
Heavy duty upright drill, with capacity to drill 3-inch hole in solid steel. Arranged for motor belt drive.
Heavy duty upright drill, with capacity to drill 4-inch hole in solid steel. Arranged for motor belt drive.
Three 20-inch upright drills, back geared, automatic feed, capacity to drill 1¼-inch hole in solid steel. Belt driven.
Heavy duty single spindle drill, capacity to drill 1½-inch hole in solid steel, with compound table, 12 speeds and 12 speed changes. Motor driven.
72-inch radial drill, with 24 changes of speed in geometrical progression, with plain table. Arranged for motor belt drive.
Double spindle drill, capacity to drill ¾-inch hole in solid steel. Motor driven.
Heavy duty radius internal grinder, working surface of vertical table 12 x 36 inches, adjustment of radius 18 to 100 inches, working surface of horizontal table 16 x 48 inches. Arranged for motor belt drive.
Cock grinder, 6 spindle, for grinding 1¼-inch angle cocks and 2-inch stop cocks. Motor driven.
Pedestal double-end spindle grinder to carry wheels of 20-inch diameter and 3-inch face. Motor driven.
Wet tool grinder to carry wheel of 24-inch diameter and 3-inch face. Motor driven.
Die grinder. Arranged for motor belt drive.
Internal grinder arranged for motor belt drive.
Grinder arranged for motor belt drive.
Five 6 x 6-inch high speed hack saws with six speed changes through gear box.
36-inch squaring shears, capacity 18 gage metal. Foot power.
200-pound hammer. Arranged for motor drive.
Pipe threading machine ¾-inch to 3-inch. Double head bolt cutter.

Refractory Gun Repairs Linings

No. 74

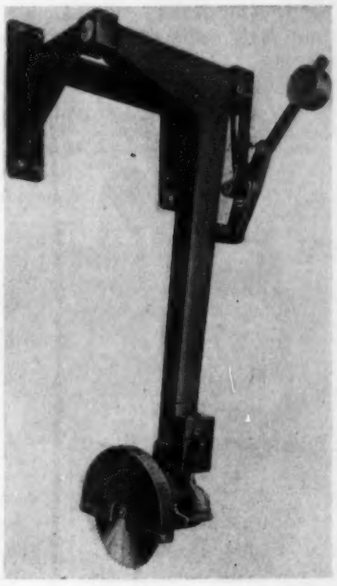
The Quigley Furnace Specialties Co., New York, has announced the design of a refractory gun used in relining, patching or surfacing furnace walls with speed. Refractory materials of the proper consistency are placed in the gun, the nozzle is pointed at the place to be repaired, compressed air is turned on by the valve control and the mixture is ejected from the nozzle. Required air pressures vary from 90 to 100 pounds, although thin mixture has required as low as 50 pounds. The gun consists of a cast iron cylinder from which the material is forced by pressure applied to the piston. The charging opening is at the top of the cylinder which has a capacity of 2 cubic feet. The unit is mounted on three wheels and can be moved from one place to another. It is claimed the gun can be used for rough white washing or paint spraying.



Swinging Saw Embodies Lightness

No. 75

The Oliver Machinery Co., Grand Rapids, Mich., has designed a swing saw for patternmaking and woodworking, a feature of which is lightness. The hanger is cast in one piece with a 37-inch base that may be mounted on either wall or ceiling. The main frame is of the single arm type and swings on large diameter ground pins. A counterbalance located about one-third of the way down on the main arm gives the arm an easy and lively motion. The motor is mounted in a housing at the lower end of the main frame and has the saw mounted on the end of the shaft. Operating speed is 3450 revolutions per minute. A safety control switch is mounted on the frame just above the motor. The saw is pulled forward into the work by a handle on the motor housing. A one-piece top guard is supplied but a nose guard is available.



Grinder Aid to Tool Conditioning

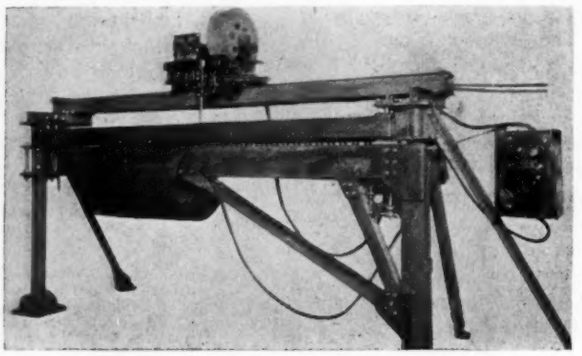
No. 76

The Oesterlein Machine Co., Cincinnati, recently has placed on the market a new universal and tool grinder, a machine intended primarily for use in railroad and automobile shops for grinding such tools as gang reamers, boring bars, bridge reamers, taps and similar tools in which large capacity, versatility of application and rapid manipulation are desired. The machine is 30 inches between centers, has a 9-inch swing and has a 7½-inch vertical movement. Construction is of the milling machine type with planer type bearings used on the table and saddle. Table reciprocation is obtained by a handwheel having two gear ratios or by a ball bearing lever feed which is provided in addition. The lever feed may be engaged at any point so that the operator may use his right or left hand in manipulating it. The wheel spindle may be set parallel to the table for plain wheels, or at right angles to the table for cup wheel grinding. In addition to tool grinding, the machine can be equipped with attachments for other work.

Offers Complete Welding Outfits

No. 78

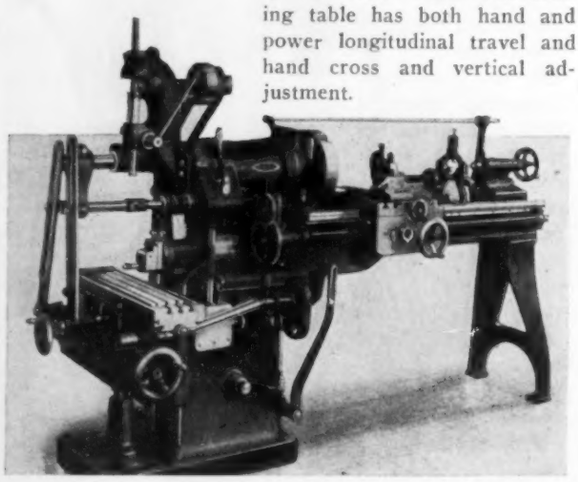
The General Electric Co., Schenectady, N. Y., has placed on the market a line of automatic arc welding equipments for use where quantity production is a factor. Its principal field is in the construction of tanks, boilers, cans, axle housings, pipe and also for repairing undercut shafts or axles and building up sharp flanges on car wheels. Its principal use, it is said, will be in making storage vessels where the static load is not greater than 10 pounds per square inch and the metal to be welded is not less than 16 gage. A complete outfit consists of an automatic welding head and control panel, travel carriage and clamping device. A complete outfit can be operated by one man and a helper. The use of push button control provides simplicity and ease in operation. The equipments are sold either as complete units or as separate parts.



Embodies Four Machines in One

No. 77

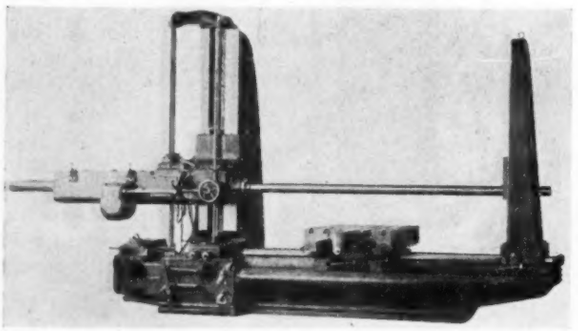
F. W. Jaeger, 140 Liberty street, New York, representative of Ernst Krause & Co., Germany, announces a new machine which is a combination lathe, shaper, milling machine and drilling machine. The power is supplied from a countershaft or from a motor mounted on the rear of the cabinet leg. Besides the general starting and stopping lever for the whole machine, each unit has separate power control hand levers for the lathe, shaping and milling units and a foot starter for the drill. Interfering motions are locked. The speeds and feeds of the units are independent of each other. Milling, shaping or drilling may be done simultaneously with lathe work. The milling table has both hand and power longitudinal travel and hand cross and vertical adjustment.



Designs Special Boring Machine

No. 79

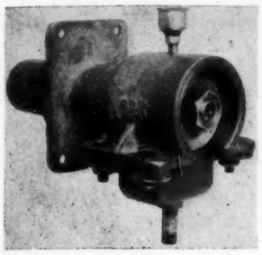
The Defiance Machine Works, Defiance, O., has just brought out a special horizontal boring, milling, drilling and tapping machine which is capable of handling a larger range of work than its standard horizontal boring mills. This machine embodies all the special features of the boring mills and in addition is made massive with ample weight and strength in the column. The base is provided with outboard supports which carry hardened steel track on which rollers under each end of the platen ride to support the overhang. The machine has centralized control of all levers giving feeds, speeds and hand operation. One lever conveniently located controls revolving of the main boring spindle in either direction. An interlocking device is arranged between quick travel and power feed. The spindles on the feed and speed boxes run in roller bearings. The head, feed and speed boxes are unit construction. Speeds range from 7½ to 157 revolutions per minute, ten speed changes being available.



Rapping Attachment Cleans Screens

No. 80

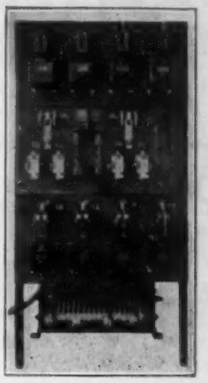
The Northern Blower Co., Cleveland, has designed for installation on dust removal equipment a rapping device to prevent the screens from becoming clogged. The device is attached to the collector by a plate with practically all of the parts on the outside. The units shown are operated by compressed air, although a motor driven or countershaft driven model is made. The rapper operates against a galvanized steel channel.



Develops Control Unit for Cranes

No. 81

The General Electric Co., Schenectady, N. Y., has brought a control unit for steel mill auxiliaries, cranes and hoists. It also has other applications where reversing and nonreversing direct current motors are used. A time limit scheme of acceleration is provided when starting and current limit for plugging when reversing. Controls are provided with instantaneous reset overload relays. Advantages claimed for it are ease in repair, accessibility of parts and simplicity of wiring.



Index of New Equipment Described in This Issue

No.	Equipment	Manufacturer	Page
58.	Roller leveler	Aetna Foundry & Machine Co.	881
59.	Planer	Cincinnati Planer Co.	881
60.	Metal saw	Hunter Saw & Machine Co.	882
61.	Stock table	Littell, F. J., Machine Co.	882
62.	Spot welder	Ames Co.	882
63.	Brake drum grinder	Landis Tool Co.	882
64.	Centerless grinder	Detroit Machine Tool Co.	883
65.	Jig boring machine	Pratt & Whitney Co.	883
66.	Bar turning machine	Brightman Bros. Co.	919
67.	Cable connector	Ohio Electric & Controller Co.	919
68.	Air motor	Standard Turbine Co.	919
69.	Die head	Geometric Tool Co.	919
70.	Air compressor	Chicago Pneumatic Tool Co.	920
71.	Industrial locomotive	Geo. D. Whitcomb Co.	920
72.	Saw sharpener	Ryerson, Joseph T., & Son, Inc.	920
73.	Creeper crane	Brown Hoisting Machinery Co.	920
74.	Refractory gun	Quigley Furnace Specialties Co.	921
75.	Swing saw	Oliver Machinery Co.	921
76.	Tool grinder	Oesterlein Machine Co.	922
77.	Combination machine	Jaeger, F. W.	922
78.	Welding outfit	General Electric Co.	922
79.	Boring mill	Defiance Machine Works	922
80.	Rapping device	Northern Blower Co.	923
81.	Hoist control	General Electric Co.	923

Machine Tools Introduced in 1925 (by Manufacturers)

Aetna Foundry & Machine Co. 4/2
Altoona Tool & Industrial Equipment Co. 2/5
Ames Co. 4/2
Badger Tool Co. 1/8
Baker Bros. Inc. 1/8
Bausch & Lomb Optical Co. 3/5
Beaudry Co. Inc. 1/8, 2/5
Bias Buff & Wheel Co., Inc. 2/5
Blacker Engineering Co. ..2/5
Brightman Bros. Co. 4/2
Brown Hoisting Machinery Co. 1/8, 4/2
Buffalo Bolt Co. 2/5
Bullard Machine Tool Co. 2/5
Chicago Pneumatic Tool Co. 3/5, 4/2
Cincinnati Planer Co. 4/2
Cleveland Worm & Gear Co. 1/8
Consolidated Machine Tool Corp. 2/5
Cutler-Hammer Mfg. Co. 2/5, 3/5
Defiance Machine Works 4/2
Detroit Machine Tool Co. 4/2
Dickson Industrial Equipment 3/5, 3/5
Earle Gear & Machine Co. 3/5
Economy Baler Co. 3/5
Fafnir Bearing Co. 3/5
Farrell-Cheek Steel Foundry Co. 2/5
Fate-Root-Heath Co. 2/5
Ferner, R. Y., Co. 2/5
Gardner Machine Co. 1/8, 2/5, 3/5
General Electric Co. 1/8, 3/5, 3/5, 3/5, 3/5, 4/2, ...4/2
Geometric Tool Co. 4/2
Globe Mfg. Co. 3/5
Hanna Engineering Works 1/8, 2/5, 3/5
Hisey-Wolf Machine Co. ..3/5
Holmes Engineering Co. ..1/8
Hunter Saw & Machine Co. 4/2
Jaeger, F. W. 4/2
Kearney & Trecker Co. 1/8, 3/5
Landis Machine Co. 2/5
Landis Tool Co. 4/2
Liberty Machine Tool Co. 1/8
Link-Belt Co. 2/5
Littell, F. J., Machine Co. 4/2
Loshbough-Jordan Tool & Machine Co. 2/5
Mitchell Engineering Co. 3/5
Modern Machine Tool Co. 2/5
Morris Machine Tool Co. 1/8
Northern Blower Co. 4/2
Oesterlein Machine Co. 4/2
Ohio Electric & Controller Co. 4/2
Oliver Machinery Co. 4/2
Pennsylvania Crusher Co. 3/5
Porter-Cable Machine Co. 2/5
Pratt & Whitney Co. 4/2
Procunier, William L. 1/8, 2/5
Quigley Furnace Specialties Co. 4/2
Racine Tool & Machine Co. 2/5
Reed Mfg. Co. 2/5
Republic Flow Meters Co. 1/8
Ryerson, Joseph T., & Son 4/2
Societe Genevoise d'Instruments de Physique 2/5
Standard Turbine Co. 4/2
Vulcan Iron Works 2/5
Warner & Swasey Co. 2/5
Whitcomb, Geo. D., Co. 4/2
Yale & Towne Mfg. Co. 3/5

Machine Tools Introduced in 1925 (by Products)

Boring and Reaming Machines
79. Heavy duty horizontal. 4/2
12. Horizontal 1/8
65. Jig 4/2

Drills
77. Combination 4/2
12. Horizontal 1/8

Grinders
47. Bench 3/5
63. Brake drum 4/2
64. Centerless 4/2
36. Portable pneumatic 2/5
44. Polishing lathe 3/5
13. Surface 1/8
10. Surface and disk 1/8
33. Swing frame 2/5
76. Tool 4/2
45. Vertical floor 3/5

Lathes and Automatics
23. Automatic 2/5
66. Bar turning 4/2
1. Bolt threader 1/8
77. Combination 4/2

Material Handling Equipment
41. Chain hoist 3/5
73. Creeper crane 4/2
18. Gasoline locomotive 2/5
34. Gasoline locomotive ..2/5
71. Gasoline locomotive 4/2
1. Locomotive crane 1/8

Milling Machines
77. Combination 4/2
9. Direct drive 1/8
43. Two spindle attachment. 3/5

Pipe Machinery
16. Threader and cutter ..2/5
22. Pipe stock 2/5

Planers
4. Heavy duty 1/8
59. Heavy duty 4/2
26. Locomotive guide 2/5

Presses, Brakes, Etc.
8. Portable pneumatic press 1/8
52. Scrap metal baler 3/5

Punches, Shears and Riveters
8. Pneumatic riveting 1/8
40. Portable pneumatic riveter 3/5
19. Punch and riveter 2/5

Saws
17. Band 2/5
60. High speed metal 4/2
75. Swing 4/2

Shapers
77. Combination 4/2

Small Tools
6. Chuck, quick change. 1/8
32. Cutting tools 2/5
69. Die head 4/2
35. Drill vise 2/5
25. Steady rest 2/5
37. Tapping attachment ..2/5

Welding Equipment
5. Electrode holder 1/8
62. Spot welder 4/2
78. Arc welding outfit 4/2

Miscellaneous
24. Abrasive wheel 2/5
57. Air compressor 3/5
70. Air compressor 4/2
68. Air motor 4/2
49. Bearing, dust proof 3/5
21. Buffing wheel 2/5
67. Cable connector 4/2
55. Coal crusher 3/5
14. Coal meter 1/8
27. Dividing machine 2/5
50. Electric valve 3/5
46. Furnace electrode controller 3/5
7. Gear reducer 1/8
20. Hammer, forging 2/5
3. Hammer, helve 1/8
15. Hammer, portable pneumatic 2/5
81. Hoist control 4/2
53. Hoist starter 3/5
51. Instrument, switchboard. 3/5
56. Metallographic apparatus 3/5
28. Motor starter 2/5
39. Motor, synchronous 3/5
30. Press tripping device. 2/5
42. Pump controller 3/5
54. Pump, suction 3/5
38. Pyrometer, indicating ..3/5
80. Rapping device 4/2
74. Refractory gun 4/2
58. Roller leveler 4/2
29. Safety collar 2/5
72. Saw sharpener, friction. 4/2
31. Screw machine container 2/5
61. Stock table and oiler. 4/2
48. Tool balancer 3/5

1924 Iron Drops 22 Per Cent

Pig Iron Production Aggregates 31,405,790 Gross Tons, According to Statistics of American Iron and Steel Institute—Total Is 8,955,356 Tons Less Than High Record of 1923

PIG iron produced in the United States during 1924 was 31,405,790 gross tons, according to the official figures just announced by the American Iron and Steel institute. As compared with the 40,361,146 tons of 1923, as a loss of 8,955,356 tons and 22.19 per cent. With the exception of 1923, the output was the largest since 1920 when the total was 36,925,987 tons. During the first half of 1924 production amounted to 17,514,485 tons and during the last half, 13,891,305 tons. The decline in the last half was 3,623,180 tons. Making up the 1924 total was 15,999,012 tons of basic, 8,172,297 tons of bessemer, 5,623,124 tons of foundry, 973,158 tons of malleable, 255,961 tons of forge and 382,238 tons of all other. On a percentage basis as compared with 1923, basic decreased 19.18 per cent; bessemer, 30.02 per cent; foundry, 13.09 per cent; malleable, 38.06 per cent and forge, 21.83 per cent. Basic represented 50.94 per cent of the total production in 1924, as compared with 49.05 per cent in 1923; bessemer, 26.02 per cent, as against 28.93 per cent and foundry, 17.9 per cent as against 16.03 per cent.

Of the country's total of pig iron, Pennsylvania made 11,068,979 tons, or 35.2 per cent; Ohio made 7,415,039 tons, or 23.6 per cent; Illinois, 2,600,864 tons, or 8.3 per cent; Indiana and Michigan, 3,350,385 tons, or 10.7 per cent.

The figures compiled by the institute show that 22,994,946 tons of the total made in 1924 was for the producer's own use, while 8,410,844 tons was made for sale. This represented a proportion of 73.2 per cent nonmerchant to 26.8 merchant. The corresponding figures for 1923 were 74 per cent and 25 per cent.

On the basis of fuel used, 31,193,080 tons of the 1924 output was made with coke, none was made with anthracite or mixed anthracite and coke, and 212,710 tons was made with charcoal. The production with coke included pig iron and ferroalloys made with electricity, electricity and coke, and coke, etc. Coke pig iron represented 99.3 per cent of the 1924 total. The corresponding ratios for 1923 and 1922 were 99.4 and 99.2 per cent respectively.

Charcoal iron which aggregated 212,710 tons in 1924 showed a loss of 38,467 tons, or 15.3 per cent. As was the case during the two preceding years only the hot and warm blast method of production was used. Production of ferromanganese and spiegeleisen totaled 301,309 tons, of which 194,243 tons was ferromanganese and 107,066 tons was spiegeleisen. In 1923, ferromanganese amounted to 247,031 tons and spiegeleisen to 129,686 tons, making a total of 376,717 tons. Ferrosilicon totaled 200,321 tons in 1924 as against 221,403 tons during the preceding year.

On June 30, active blast furnaces totaled 164, while on Dec. 31, 235 of the country's total of 425 were in operation. At the close of 1923, 239 were active.

PRODUCTION OF COLD AND HOT AND WARM BLAST CHARCOAL PIG IRON, 1920–1924

Kinds of iron.	1920.	1921	1922.	1923.	1924.
Cold blast	1,734	350	.....	.....	.....
Hot and warm blast	321,662	94,380	224,731	251,177	212,710
Total.....Gross tons.	323,396	94,730	224,731	251,177	212,710

TOTAL PRODUCTION OF PIG IRON ACCORDING TO FUEL USED

States.	Blast furnaces.*				Production—Gross tons. (Includes spiegeleisen, ferro-mang., ferro-silicon, ferro-phosphorus, etc.)		
	In blast June 30, 1924.	Dec. 31, 1924.					
		In.	Out.	Total.	First half of 1924.	Second half of 1924.	Total 1924.
Coke*	156	228	171	399	17,406,693	13,786,387	31,193,080
Anthracite†	0	0	2	2	.....	.....	.....
Charcoal	8	7	17	24	107,792	104,918	212,710
Total	164	235	190	425	17,514,485	13,891,305	31,405,790

*Includes pig iron and ferro-alloys made with electricity, electricity and coke, etc.
†Includes mixed anthracite and coke pig iron.

PIG IRON MADE FOR SALE OR FOR USE OF MAKERS IN 1924

Grades.	For sale.	For maker's use.	Total. Gross tons.
Basic	1,606,822	14,392,190	15,999,012
Bessemer and low-phosphorus	619,139	7,553,158	8,172,297
Foundry, including ferro-silicon	5,039,329	583,795	5,623,124
Malleable	865,859	107,299	973,158
Forge or mill	123,200	132,761	255,961
Ferro-manganese	54,638	139,605	194,243
Spiegeleisen	69,135	37,931	107,066
All other grades	32,722	48,207	80,929
Total.....Gross tons.	8,410,844	22,994,946	31,405,790

PRODUCTION OF PIG IRON BY GRADES, 1909–1924

Years	Basic.	Bessemer.	Foundry.	Malleable.	Forge.	All other.	Total. Gross tons.
1909.	8,850,225	10,557,370	5,322,415	658,048	725,624	281,789	25,795,471
1910.	9,084,608	11,245,642	5,260,447	843,123	564,157	305,590	27,303,567
1911.	8,520,020	9,409,303	4,468,940	612,533	408,841	229,910	23,649,547
1912.	11,417,886	11,664,015	5,073,873	825,643	469,183	276,337	29,726,937
1913.	12,536,693	11,590,113	5,220,343	993,736	324,407	300,860	30,966,152
1914.	9,670,687	7,859,127	4,533,254	671,771	361,651	235,754	23,332,244
1915.	13,093,214	10,523,306	4,843,899	829,921	316,214	309,659	29,916,213
1916.	17,684,087	14,422,457	5,553,644	921,486	348,344	504,779	39,434,797
1917.	17,671,662	13,714,732	5,328,258	1,015,579	345,707	545,278	38,621,216
1918.	18,646,174	13,024,966	5,145,260	1,117,914	393,932	726,398	39,054,644
1919.	14,494,131	9,975,934	4,916,758	1,009,049	271,286	348,206	31,015,364
1920.	16,737,722	12,062,084	5,957,782	1,310,951	318,048	539,400	36,925,987
1921.	7,753,071	5,595,215	2,568,136	457,340	112,748	201,616	16,688,126
1922.	13,841,367	7,813,203	3,976,431	1,051,495	214,210	323,198	27,219,904
1923.	19,795,590	11,677,509	6,470,013	1,571,064	327,430	519,540	40,361,146
1924.	15,999,012	8,172,297	5,623,124	973,158	255,961	382,238	31,405,790

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

COLUMBUS, GA.—S. H. Browning, 211 Clifton road, has started construction of a plant for general machine shop and electrical equipment work and will need equipment.

BELLEVILLE, ILL.—Remsnider Valve Corp., Iowa street and Grand avenue, has been incorporated with $5000 capital to manufacture valves by William S. Schafer, T. J. Flynn and George Remsnider. Louis E. Wangelin, Belleville, is correspondent.

CHICAGO—Apex Products Co., 3243 West Thirtieth street, has been incorporated with $200,000 capital to manufacture laundering machinery, by J. H. Jones, Daniel M. Healy and Joseph F. Cervenks. Healy & Reid 111 West Washington street, are correspondents.

CHICAGO—Good Hardware & Paint Co., 127 North Dearborn street, has been incorporated with $5000 capital to manufacture hardware, cutlery and household appliances by Morris Lidskin, Sarah Lidskin and Herman S. Waldstein, 127 North Dearborn street.

CHICAGO—Hibbard, Spencer, Bartless & Co., hardware manufacturers and jobbers, will build a 13-story office building and warehouse at North Water street and North Michigan boulevard, 135 x173 x 193 x 423 feet. C. J. Whipple is vice president.

CHICAGO—Woodman Railway Supply Co., 80 East Jackson boulebard, has been incorporated with 200 shares no par value to manufacture appliances for steam and electric railroads by George A. Woodman, A. M. Talbot and A. M. Tufts, 223 Railway Exchange building.

CHICAGO—Ottawa Silica Moulding Co., 105 South LaSalle street, has been incorporated with 1000 shares of no par value to manufacture sand, clay and other foundry supplies by Edmond W. Pottle, V. C. Johnson, and William B. Gilmore. Sherman M. Booth, Borland building, is correspondent.

CHICAGO—Chicago Meter Service Co., 7656 South Halsted street, has been incorporated with 250 shares no par value to manufacture machinery and appliances, by M. Mucklestone, W. J. Biebel and M. O'Toole. F. E. Brightman, 1514 First National bank building, is correspondent.

CHICAGO—Railway Car Forging Co., 20 West Jackson boulevard, has been incorporated with 15,000 shares no par value to manufacture iron, steel and metal products by Charles Aaron, Ely M. Aaron and Charles E. Clark. Charles Aaron, 76 West Monroe street, is correspondent.

CHICAGO—Lake Park Metal & Machine Co. 5135 Lake Park avenue, has been incorporated with $4000 capital to manufacture machinery and sheet metal products by John I. Spitzer, Tillie Spitzer and Alex Spitzer. Daniel Mombiner, 111 West Monroe street, is correspondent.

PRINCETON, ILL.—Anti-Hotbox Co., 426 South Pleasant street, has been incorporated with $1000 capital to manufacture a cooling compound for machinery, by W. O. Stevens, Nellie A. Stevens and Charles Stevens Jr. Josef T. Skinner, Princeton, is correspondent.

FORT WAYNE, IND.—Tokheim Oil Tank & Pump Co., East Wabash street, is building a tank shop 80x200 feet. General contract to Olds Bros., 112 First National bank building.

RICHMOND, IND.—Kiromac Mfg. Co. has been incorporated with 2000 shares no par value and $10,000 preferred, by W. H. Kienker, S. S. Rockwell and J. J. McCauley.

LOUISVILLE, KY.—Vogt Refrigerator Co. is having plans prepared for a plant at 616 Barrett avenue, for the manufacture of refrigerating apparatus.

BALTIMORE, MD.—Board of awards of the city, city hall, will build a repair shop for the fire department on Key street.

BALTIMORE, MD.—Onlee Piston Ring Co., 2 East Lexington street, has been incorporated

(*Continued on Page 927*)

Industrial Business Changes

UNITED STATES REFRACTORIES CORP., Mount Union, Pa., has closed its sales offices at Pittsburgh and Philadelphia and will handle business in those districts direct from the main office.

* * *

National Malleable & Steel Castings Co., Cleveland, has moved its Chicago sales office from 311 to 501 Railway Exchange building, 80 East Jackson boulevard, Chicago.

* * *

Farr Co., H. H. Farr, superintendent, Meridian, Miss., has bought the plant of the Marty Foundry Co. and will continue the business as formerly.

* * *

Peter A. Frasse & Co., Philadelphia, jobbers in iron and steel, are moving from their plant on Arch street to a new plant at Wissahickon and Hunting Park avenues.

* * *

Standard Turbine Corp., Scio, N. Y., has appointed the Hale-Stephan Co., 7016 Euclid avenue, Cleveland, as district representative.

* * *

Pfanmueller Engineering Co., Ashland and Thirty-seventh street, Chicago, has leased 60,000 square feet of floor space in its building at that address to the National Transit Co.

* * *

The Technical Service Co., industrial consultant and factory specialist, Woolworth building, New York City, has moved to larger quarters in the same building.

* * *

Globe Seamless Tubes Co., Milwaukee, Wis., has opened a district sales office at 444 Frisco building, St. Louis, Mo., in charge of E. C. Carroll, Milwaukee, as manager of sales.

* * *

Olympic Wheel Co., Seattle, Wash., manufacturer of steel automobile wheels, has leased a machine shop buliding at Salmon Bay terminal, from commissioners of the port, and will remove its business there.

* * *

J. S. McCormick Co., Pittsburgh, dealer in foundry equipment and supplies, has been appointed eastern representative for the Charles J. Clark Blast Meter Co., Gladbook, Ia., manufacturer of blast meters and pressure gages for cupolas.

* * *

Heyl & Patterson, Inc., construction engineers, announce removal of their eastern office from 90 West street, New York, to the Pershing Square building, 100 East Forty-second street, April 1. E. Logan Hill is eastern manager.

* * *

Southern Sheet & Tin Plate Co., Ashland, Ky., formerly owned and operated by the late E. J. Job, has been bought by Hugh L. Russell and Harry M. Dobson, who will continue the business. Sheet metal roofing and siding is its principal product.

March Warehouse Tonnage Gains

Spotty Improvement Shown in Month Just Ended

TOTAL sales volume in March by iron and steel warehouse interests generally shows an increase over February, but the aggregate in tonnage and cash is below the seasonal normal. Steady improvement was shown during March in some districts, but even there betterment was not uniform, and was restricted to a relatively few interests. Prices have remained fairly steady, few cuts being made. The outlook for April business is good, with buying improving and prices remaining firm.

Continued good demand for structural materials and reinforcing bars features the warehouse situation in New York. There has been a fairly good demand also for black and galvanized sheets the recent reduction of $3 a ton on those products apparently having a stimulating influence on buying. March has been the best in sometime for most New York district jobbers, although business has not been up to the levels expected for this season. Prices are steady, with more firmness in pipe than previously noted.

Prices are unchanged at Pittsburgh. Demand is heavy there for iron and steel products, numerous buyers requiring small quantities quickly. Warehouse operators are well satisfied with the way buying is improving.

Daily average business in March was better than in February according to one Cleveland warehouse interest. This was not the general rule, as in a few cases March total business barely exceeded February's. With the exception of several drastic price reductions on specific tonnages during the past week, the market was firm. The reductions were a quasi-mill proposition and cannot be regarded as factors in determining warehouse quotations.

Effective March 30 the Chicago iron and steel warehouses placed universal mill and sheared plates on the same price basis—3.30c, Chicago warehouse. Formerly the universal mill plates had been quoted at 3.60c. The Chicago warehouses have adopted, as of March 30, the new extra card on hoops and bands. The 50 cent differential on sizes under 22 gage and 1-inch or narrower has been eliminated.

Iron and stel warehouse demand at Buffalo is not quite as active as some sellers had anticipated but is holding fairly steady and is generally representative of consumers. No particular material has been especially active. Prices are unchanged.

Quotations at Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.10c
Detroit	3.15c
Los Angeles	3.20c
New York	3.24c
Philadelphia	3.20c
Pittsburgh	2.90c
Portland	3.25c
San Francisco	3.30c
Seattle	3.25c
St. Louis	3.15c
St. Paul	3.25c

IRON BARS

Boston	3.265c
Buffalo	3.35c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.15c
New York	3.24c
Philadelphia	3.20c
St. Louis	3.15c

REINFORCING BARS

Boston	3.25c to 3.50c
Buffalo	3.40c
Chicago	2.60c to 2.70c
Cincinnati	3.30c
Cleveland	2.85c to 3.10c
Detroit	3.15c
Los Angeles, C. L.	3.60c
Los Angeles, L. C. L.	4.00c
New York	2.80c
Philadelphia	2.80c to 3.20c
Pittsburgh	2.30c to 2.60c
San Francisco, C. L.	3.35c
San Francisco, L. C. L.	3.80c
Seattle	3.50c

STANDARD STRUCTURAL SHAPES

Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.20c
Detroit	3.25c
Los Angeles	3.25c
New York	3.34c
Philadelphia	2.80c to 3.25c
Pittsburgh	3.00c
Portland	3.35c
San Francisco	3.30c
Seattle	3.35c
St. Louis	3.25c
St. Paul	3.35c

PLATES

Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-inch and thicker	3.20c
Cleveland, 3/16-inch	3.425c
Detroit	3.25c
Detroit, 3/16-inch	3.45c
Los Angeles	3.25c
New York	3.34c
Philadelphia	2.80c to 3.20c
Philadelphia, 3/16-inch	3.00c to 3.40c
Pittsburgh	3.00c
Portland	3.25c
San Francisco	3.30c
Seattle	3.25c
St. Louis	3.25c
St. Paul	3.35c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	3.915c
Buffalo	4.05c
Chicago	3.80c
Cincinnati	3.90c
Cleveland	3.45c to 3.75c
Detroit	4.00c
Los Angeles	4.20c
New York	3.89c
Philadelphia	3.85c
Portland	4.50c
San Francisco	4.20c
Seattle	4.50c
St. Louis	3.90c
St. Paul	4.05c

NO. 28 BLACK SHEETS

Boston	5.20c
Buffalo	4.75c
Chicago	4.50c
Cincinnati	4.55c
Cleveland	4.35c to 4.55c
Detroit	4.65c
Los Angeles	5.25c
New York	4.60c
Philadelphia	4.85c
Portland	5.50c
San Francisco	5.25c
Seattle	5.50c
St. Louis	4.80c
St. Paul	4.85c

NO. 28 GALVANIZED SHEETS

Boston	6.25c
Buffalo	5.85c
Chicago	5.50c
Cincinnati	5.65c
Cleveland	5.45c to 5.65c
Detroit	5.75c
Los Angeles	6.25c
New York	5.60c
Philadelphia	6.00c
Portland	6.50c
San Francisco	6.25c
Seattle	6.50c
St. Louis	5.80c
St. Paul	5.65c to 5.90c

BANDS

Boston	4.015c
Buffalo	4.05c
Chicago	3.65c
Cincinnati	3.95c
Cleveland	3.85c
Detroit	3.80c
Los Angeles	4.20c
New York	3.99c
Philadelphia	3.95c
Pittsburgh	3.60c
Portland	4.25c
San Francisco	4.15c
Seattle	4.25c
St. Paul	3.90c

HOOPS

Boston	5.50c
Buffalo	4.40c
Chicago	4.15c
Cleveland	3.85c
Detroit	4.30c
New York	4.49c
Philadelphia	4.20c
Pittsburgh	3.60c
Seattle	5.00c
St. Paul	4.70c

COLD FINISHED STEEL

Boston (shapes)	4.65c
Boston (rounds)	4.15c
Buffalo (rounds)	4.20c
Buffalo (shapes)	4.70c
Chicago (shapes)	4.30c
Chicago (rounds)	3.80c
Cincinnati (rounds)	4.05c
Cincinnati (shapes)	4.55c
Cleveland (rounds)	4.00c
Cleveland (shapes)	4.50c
Detroit (rounds)	4.10c
Detroit (shapes)	4.60c
Los Angeles (rounds)	5.25c
New York (rounds)	4.15c
New York (shapes)	4.65c
Philadelphia (rounds)	4.15c
Philadelphia (shapes)	4.65c
Pittsburgh (rounds)	3.80c
Pittsburgh (shapes)	4.30c
Portland	5.00c
San Francisco (rounds)	5.25c
Seattle (rounds)	4.75c
St. Paul (rounds)	4.05c

FOREIGN IRON AND STEEL

Swedish hollow drill steel New York, duty paid	15.00c
Swedish iron bars round New York, duty paid	6.75c
flats and squares, New York, duty paid	7.00c

WELDED PIPE

Discounts from warehouse, New York City Standard Steel Pipe

WROUGHT STEEL PIPE

	Black	Galvanized
⅛-inch butt	—23	+21
¼ to ⅜-inch butt	—36	— 3
½-inch butt	—46	—29
¾-inch butt	—51	—37
1 to 3-inch butt	—53	—39
2-inch lap	—40	—22
2½ to 6 inch lap	—48	—35
7 and 8-inch lap	—44	—17
9 and 10-inch lap	—38	—14
11 and 12-inch lap	—37	—12

WROUGHT IRON PIPE

	Black	Galvanized
¼ to ⅜-inch butt	+44%	+78%
½-inch butt	— 4	+19
¾-inch butt	—11	+ 9
1 to 1½-inch butt	—14	+ 6
2-inch lap	— 5	+14
2½-inch lap	— 9	+ 9
3 to 6-inch lap	—11	+ 6
7 to 12-inch lap	— 3	+16

Construction and Enterprise

(*Continued from Page 927*)

with $10,000 capital by John Ryan, and Otto W. Diffenbach.

DETROIT, MICH.—Hudson Motor Co., 12601 Jefferson avenue, has awarded the contract for an addition 3 stories, 80 x 639 feet and 80 x 180 feet, for an assembly plant.

DETROIT, MICH.—W. & T. Metal Products Corp. has been incorporated with $10,000 capital to manufacture heaters and other sheet metal work by Isidor White, Jennie White and Louis Tonkin, 1036 East Warren avenue.

DETROIT, MICH—Electro-Chemical Pattern & Mfg. Co. has been incorporated to manufacture patterns and dies with $40,000 capital by George B. Sherman, John G. Laukel and Arthur K. Laukel, 289 Chalmers avenue.

FENTON, MICH.—Fenton Tool & Die Co. is expanding its facilities and adding die-making equipment. A plant addition will be started shortly.

HASTINGS, MICH.—Viking Corp., manufacturer of fire protection apparatus, is having plans made for an addition to its plant.

HILLSDALE, MICH.—Alamo Corp. has been incorporated with $500,000 capital to manufacture lighting fixtures and appliances by Joseph T. and Bertha R. Schlacks and Evalyn Young, 3501 Milwaukee avenue.

PLYMOUTH, MICH.—Dunn Steel Products Co. has been incorporated with $100,000 capital to manufacture metal products by Andrew C. Dunn, Harry B. Garrison and Norman W. Cummins, 1615 Sheridan avenue.

MINNEAPOLIS, MINN.—James Hill Mfg. Co., 416 Erie street, S. E., will build a 1-story plant 60x100 feet at Erie and Delaware streets Nelson & Billman, 3041 Aldrich avenue, South, engineers.

NATCHEZ, MISS.—The Natchez & Southern railroad, O. O. Ogden, general manager, is planning a roundhouse, machine shop and 30,000-gallon steel tank and tower at Natchez.

ST. LOUIS, MO.—City of St. Louis will build a 2-story shop for manual training at the Bellefontaine Industrial farm. L. R. Bowen, 301 City Hall, is engineer.

ST. LOUIS, MO.—J. M. Carpenter & Co., Wainwright building, has let a contract for remodeling its foundry plant at 1705 North Ninth street to J. J. Bassett, 926 North Twenty-sixth street.

CAMDEN, N. J.—Hopatcong Coaster Co. has been incorporated with $50,000 capital to carry on a manufacturing business. New Jersey Corporation Guarantee Trust Co., Camden, is attorney.

JERSEY CITY, N. J.—Asbestos Co. of New York has been incorporated with $50,000 capital to manufacture heat-saving appliances by Thomas J. Casey, Jersey City, James J. Reilly, Brooklyn, and Charles J. Saitta. Westfield, N. J. Cannon & Cannon, Jersey City, are attorneys.

NEWARK, N. J.—Atlantic Mfg. Co., Oscar Soudheim president, 50 Nassau street, will build a light manufacturing building 120x160 feet at 553 South Belmont avenue. Harry M. Veix, 738 Broad street, is architect.

NEWARK, N. J.—Eagle Tube Co. has been incorporated with $50,000 capital to manufacfacture radio supplies and appliances by Joseph A. Dorrity, Fred W. Germer and F. N. Brown. Joseph A. Dorrity, Newark, is attorney.

TRENTON, N. J.—The state board of education has awarded a contract for a 2-story workshop for the state school for the deaf at Trenton Junction.

TRENTON, N. J.—Work will be started at once by the John A. Roeblings' Sons Co., on a $40,000 plant addition, 1-story, 96 x 158 feet. The company manufactures wire rope, cables, etc.

Where additional information is presented, reference is made to date of issue in which previous item appeared.

LONG ISLAND CITY, N. Y.—C. N. West Disinfecting Co. has let contract to White Construction Co., 95 Madison avenue, New York, for a factory, warehouse and power plant, 1-story 30x43 feet, five stories 21x106x141 feet, adjoining its present plant.

NEW YORK—Alpha Iron Works has been incorporated with $21,000 capital by S. Cohen, H. Greenstein and I. Hoffberg. H. Ackerman, 1133 Broadway, is attorney.

NEW YORK—Watson Wagons has been incorporated with $10,000 capital by M. M. Frank, L. Bellin and R. L. Marcus. M. Rosenthal, 645 Tremont avenue, is attorney.

NEW YORK—Mactile Machine Co. has been incorporated with 250 shares $100 each and 600 shares common no par value by S. Linehan, T. Gerus and J. J. Murphy. G. A. Nagle, Jamaica, is attorney.

NEW YORK—New York Asbestos Co. has been incorporated with 300 shares at $50 each and 1000 common no par value to serve as insulating engineers by J. Fletcher, and W. Laier. L. J. Murray, 22 William street, is attorney.

NEW YORK—Cosmos Steel Corp. has been incorporated with $100,000 capital by L. W. Lissberger, G. A. Evalenko and E. L. Rockmore. Baron, Rice & Rockmore, 220 West Forty-second street, are attorneys.

NEW YORK—Open-Metal Mfg. Co. has been incorporated with $20,000 capital by I. B. Funt, G. Kaplan and S. Null. Kopp, Markewich & Perlman, 51 Chambers street, are attorneys.

NEW YORK—Marks Machine Co. has been incorporated with $30,000 capital to manufacture air compressors by H. Kattlemann, and W. L. Gross. M. E. Reiburn, 160 Broadway, is attorney.

NEW YORK—Stevenson Products Corp. has been incorporated to manufacture mineral products with $50,000 capital by J. L. Goldman and A. Welsbach. L. J. Feinstein, 47 West Fifty-fourth street, is attorney.

NEW YORK—Carew Greene Engineering Co. has been incorporated with 500 shares common stock no par value to manufacture devices to separate steam from water by E. Greene, L. S. Greene and W. A. Carew. Merrill, Gifford, Rogers & Woody, 60 Broadway, are attorneys.

CHARLOTTE, N. C.—Chimney Rock Mountains, Inc., has awarded contracts for a dam and power plant at Chimney Rock, the project being estimated to cost $700,000.

DURHAM, N. C.—E. D. Bowling and associates are having plans made for a plant for the manufacture of cotton mill appliances.

ASHTABULA, O.—Challenge Mfg. Co. has been incorporated with $15,000 capital by John A. Bloom and Fred Hill.

CLEVELAND—Ohio Clutch & Machine Co. has been incorporated with $10,000 capital by James P. Swanda and John C. Maher.

CLEVELAND—Modern Sheet Metal Works Co. has been incorporated with $10,000 capital by Rae Letter and Gertrude Parnes.

CLEVELAND—Greene Gas Cleaner Co. has been incorporated with $2500 capital by Cary R. Alburn and Oscar V. Greene.

CLEVELAND—Cleveland Illuminating Co. will build an addition to its station at 1953 East 105th street two stories 46x54 feet.

CLEVELAND—Green, Haas & Schwartz Co., Houghton, Mich., E. Haas, president will build a storage and shipping building at Madison avenue and Berea road, 3 stories 50x50 feet, and make factory alterations on former Winton plant.

DAYTON, O.—National Foundry & Furnace Repair Co. has been incorporated with $50,000 capital by Martin Bloch and Samuel L. Finn.

DAYTON, O.—Allied Auto Parts Co. has been incorporated with $20,000 capital by C. Forster Hahne, Flora M. Hahne, William J. Meyer and John A. Kapeller.

HAMILTON, O.—Safety Gas Iron & Products Co. has been incorporated with $15,000 capital by C. W. Simpson and Frank D. Shelby.

NEWARK, O.—Marietta Magazine & Torpedo Co. S. W. King, manager, will build its plant recently destroyed by an explosion.

TOLEDO, O.—Toledo Timer Co. has been incorporated with $10,000 capital by Louis A. Alexander, L. C. Crabbs, C. H. Kuhlman, L. C. Kroncke and George W. Fluckey.

YOUNGSTOWN, O.—Pittsburgh Scrap Iron & Metal Co. has been incorporated with $10,000 capital by Samuel Zoss and Peter Godman.

YOUNGSTOWN, O. — Continental Steel Products Co. has been incorporated with $10,000 capital by C. E. Heil and E. Maiden.

OKLAHOMA CITY, OKLA.—Central Bridge & Construction Co. has been incorporated with $50,000 capitalization by John B. Klein, Terminal building, and Truman Evans.

OKLAHOMA CITY, OKLA.—Boardway Co., North Maple street, is having plans made for an addition 60 x 88 feet to its steel metal working department, including a new machine shop.

SALEM, OREG.—A petition has been filed here declaring intention of the Nevada-California-Oregon Railway to extend its line north from Lakeview, Oreg.

BETHLEHEM, PA.—The Splitdorf-Bethlehem Electrical Co., a consolidation of the Bethlehem Spark Plug Co. and the Splitdorf Electrical Co., contemplates the expansion of facilities for manufacturing radio equipment. F. H. Schwab, this city, heads the new organization.

CRUM LYNNE, PA.—Eagan & Johnson have let a contract for the structural steel to McClintic-Marshall Co., for an addition to their foundry building, 1-story, 51x200 feet, 60x80 feet and 53x60 feet.

HANOVER, PA.—Mummert & Dixon, Ervin S. Mummert president, is planning an addition to pattern and machine shop, 80x120 feet.

PHILADELPHIA—Contract will be placed shortly by the Henry Disston & Sons Co., Tacony, for the erection of an addition costing $75,000.

PHILADELPHIA—Catte Bros. Corp., 1712 North Ninth street, will build a galvanizing shop and office 60 x 202 feet. Carson & Carson, 22 South Fifteenth street, are engineers.

PHILADELPHIA—Brooks Bros., A. Brooks president, Marshall, Pa., will build a 3-story factory 60x80 feet, 4841 Lancaster avenue. Amos W. Barnes, Perry building, is architect.

PHILADELPHIA—The Philadelphia Grain Elevator Co., has filed plans for the erection of a $3,500,000 grain elevator at Port Richmond. Plans have been prepared by the Fegles Construction Co., Minneapolis.

PHILADELPHIA—The Counties Gas &

Electric Co. will start work shortly on the erection of a $400,000 generating house at its West Conshohocken plant. The unit will have a capacity of 2,500,000 cubic feet per day, and additional equipment will include coal handling apparatus and oil storage tanks.

GREENVILLE, S. C.—Greenville Steel & Foundry Co., North Markley and Grace streets, mill machine parts castings, has plans for increasing its plant and facilities.

CHATTANOOGA, TENN.—Casey-Hedges Co., Whiteside street, manufacturer of boilers and similar products, plans an addition this spring and a further building program later in the year.

EL PASO, TEX.—Elliott Engineering Co. has been incorporated with $25,000 capitalization by W. Frank Lucas and Fred A. Elliott, 3101 Copper street.

HOUSTON, TEX.—J. H. Dore, 1203 Oakdale street, is having plans made for a foundry 75 x 200 feet.

HOUSTON, TEX.—Continental Supply Co., 6120 Harrisburg boulevard, will build a modern warehouse for handling oil well supplies and similar products, on a site just purchased. E. J. Drake is district manager.

HOUSTON, TEX.—Houston Car Wheel & Machine Co., White and Spring streets, will build extensions, including an electric furnace, 5-ton and 10-ton electric traveling cranes and a number of heavy duty machine tools. J. H. Dore is president.

SAN ANTONIO, TEX.—Ward Heater Co., 1243 South Hope street, Los Angeles, Calif., has plans for a 1 and 2-story plant at San Antonio, including foundry plating and assembling departments.

TEXAS CITY, TEX.—Pierce Petroleum Corp., 111 Broadway, New York is having plans prepared for large extensions and improvement to plant here.

WACO, TEX.—Waco Steel Products Co. has been incorporated with $1000 capital stock to manufacture a machine for destruction of the boll weevil and other products, by V. Neville, Delgado, N. Y.; A. L. Dunnigan, Dallas, and Kyle Vick, Waco.

WICHITA FALLS, TEX.—Phillips Petroleum Co. has purchased holdings of Macon Oil & Gas Co. in Wilmott oil field and plans erection of natural gasoline plant. Engine compressors and miscellaneous plant equipment will be needed. F. E. Rice, First National Bank building, Bartlesville, Okla., is general superintendent of gasoline department.

SPENCER, VA.—Spencer Machine Co. has been formed by Alonzo Runnion and James Grant to operate a machine shop, acetylene welding and general machine work.

BREMERTON, WASH.—Newport Contracting & Engineering Co., Newport News, Va., has the contract for an extension to the west end of the Puget Sound Navy Yard power plant for which $90,197 has been appropirated. Completion is called for in six months.

CHEHALIS, WASH.—Cowlitz, Chehalis & Cascade Ry. has asked permission of the I. C. C. for a $729,000 bond issue to finance a 14-mile extension. The new mileage is planned to open up a large stand of virgin timber. The new track is estimated to cost $400,000.

MONTESANO, WASH.—Plans for a proposed water system to cost $100,000 are being completed by Barr & Cunningham, consulting engineers, Spalding Bldg., Portland, Ore.

SEATTLE, WASH—Hofius Steel & Equipment Co. has awarded to Thomas A. Loftus the contract for two warehouses and a garage building at First avenue and Hudson street.

SEATTLE, WASH.—Extensive plant additions and installation of machinery and equipment to double present production of the Olympic Steel Works, 151 West Horton St., have been announced. Plans call for a 40 x 80-foot addition to the main foundry building, addition to the core room, new carpenter shop and installation of a craneway. New equipment will include an electric furnace and a new core oven.

TACOMA, WASH.—Enterprise Foundry Co. has been incorporated with $10,000 capital stock.

TACOMA, WASH.—City officials have authorized purchase of a site for an office building to house both water and light departments, store and warehouse rooms and a down town power substation.

WALLA WALLA, WASH.—City is planning construction of septic tank at an estimated cost of $150,000. Various types are being investigated and plans will be prepared forthwith.

YAKIMA, WASH.—Citizens have endorsed a plan to acquire the water system owned by the Pacific Power & Light Co. If the deal is consummated extensions and improvements will be made.

CLARKSBURG, W. VA.—W. Call Co. is planning a branch plant at Wheeling, W. Va., to manufacture acetylene torches. Charles May is manager of the Wheeling branch of the Call company.

BELOIT, WIS.—Beloit Iron Works, A. Aldrich president, is preparing to erect a plant at South Beloit, Ill., a suburb.

CAMBRIA, WIS.—Bids close March 31 with W. C. Davies, village clerk, on a waterworks and sewerage system requiring two motor and engine driven centrifugal pumps of 300 gallons per minute capacity each. A 50,000-gallon steel tank and tower also are included in the plans, by W. G. Kirchhoffer, consulting engineer, Madison, Wis.

JANESVILLE, WIS.—Janesville chamber of commerce, 114 East Milwaukee street, Oscar N. Nelson, secretary, is having plans prepared for a manufacturing plant costing $200,000 which will be rented or sold to some industrial user.

MILWAUKEE—J. W. Nicholson, city purchasing agent, is taking bids for furnishing the city garage with three portable air compressors.

MILWAUKEE—Contracts have been let by the Milwaukee Grey Iron Foundry Co., Thirty-ninth avenue and Mitchell street, for a 1-story brick and concrete shop addition, 45 x 110 feet.

MILWAUKEE—J. B. Drahonovsky, 758 Montana avenue, has incorporated the New Era Combustion Turbine Engine Co., capital stock $35,000, to manufacture his invention of a new type of engine for motor vehicles.

RACINE, WIS.—A. G. Gales, 1638 Villa street, is having plans prepared for a 2-story machine shop plant 40x80 feet. A. L. Flegel, Baker building, is architect.

RACINE, WIS.—Simms Ferro Casting Co., H. R. Simms, general manager, Layard and Douglas streets, is planning addition to foundry plant for 1926.

RACINE, WIS.—Standard Foundry Co., 7500 Kewanee street, T. Jane, manager, is taking bids on two foundry buildings, 1-story, 90x240 feet. A. A. Wickland & Co., 5 South Wabash avenue, Chicago, are engineers in charge.

SHEBOYGAN, WIS.—Contracts were let March 23 by the R. H. Thieman Co., 816 Niagara avenue, Ford distributor for a new sales and service building costing $125,000 on North Eighth street, near St. Clair avenue. Architect W. C. Weeks is in charge.

Business in Canada

CALGARY, ALTA.—Bennett & White Construction Co. Ltd., has been incorporated with $100,000 capital by Alexander Hannah, Orrin H. E. Might and Everett J. Chambers.

CALGARY, ALTA.—W. W. Grant, Ltd. has been incorporated with $300,000 capital to manufacture radio apparatus, telephones and similar

Iron and Manganese Ores and Minerals

Iron Ore

LAKE SUPERIOR ORES

Per Gross Ton Lower Lake Ports

Old range bessemer, 55 per cent iron	$5.65
Mesabi bessemer, 55 per cent iron	5.40
Old Range nonbessemer, 51½ per cent iron	4.90
Mesabi nonbessemer, 51½ per cent iron	4.75

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic 53 to 63 per cent	9.00 to 10.00
Copper free low phosphorus 53 to 65 per cent	nominal

FOREIGN IRON ORE

Cents per unit, f.o.b. cars Atlantic ports

Spanish low phosphorus, 52 to 54 per cent	9.50 to 10.00
Algerian low phosphorus, 52 to 54 per cent	nominal
Swedish and Norwegian low phosphorus, 68 per cent.	11.00 to 11.50
Swedish foundry or basic, 66 to 68 per cent	9.00 to 10.00
Spanish foundry or basic, 50 to 54 per cent	8.50 to 9.00
Algerian foundry and basic, 50 to 54 per cent	8.50 to 9.00

Manganese Ore

Prices do not include duty at rate of 1 cent per pound of metallic manganese contained.

Brazilian, minimum 47 per cent....nominal
Indian, minimum 47 per cent....nominal
Caucasian, 53 to 55 per cent ....
....Washed, 43 to 44 cents c.i.f. tidewater

Fluor Spar

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton	$18.00 to 20.00
Washed gravel, imported duty paid eastern tidewater, per net ton	17.00 to 17.50

devices by William W. Grant, Charles B. Clarke and Robert L. Brews.

VANCOUVER, B. C.—Colby Crane & Engineering Co., Ltd., 1404 Standard Bank Bldg., has incorporated for $20,000.

ST. BONIFACE, MAN.—The Harris Abattoir Co., Toronto, Ont., has let the general contract to James McDiarmid Co., Ltd., and the steel contract to the Vulcan Iron Works, both of Winnipeg, Man., for a packing plant to be erected here at a cost of $400,000. Equipment contracts which will amount to about $500,000 will be awarded later.

GUELPH, ONT.—White Sewing Machine Co. of Canada has been incorporated with $50,000 capital by Leo. W. Goetz, Angus Dunbar and Grace Roberts.

HAMILTON, ONT.—The hydro commission will build a sub-station and garage on Hughson street north, to cost $200,000.

HAMILTON, ONT.—S. H. Kent, City Clek, is receiving bids for a 15-horsepower and a 3-horsepower vertical induction motor, switchboard, etc., for the Strachan avenue sewage pumping station. W. L. McFaul is city engineer.

KITCHENER, ONT.—The Kaufman Rubber Co. proposes to build an addition to its factory here to cost between $50,000 and $100,000.

LEAMINGTON, ONT.—Town council will shortly ask for bids on two centrifugal pumps, motors and the erection of a pump house, etc., in connection with waterworks system.

LONDON, ONT.—Williams Canning Co. has been incorporated with $100,000 capital by Frank E. Williams, John C. Elliott and Samuel Willis.

LONDON, ONT.—The London utilities commission is having plans prepared for addition to waterworks plant to cost $100,000. E. V. Buchanan is manager.

MIMICO, ONT.—The town council has passed on a proposition to build a pumping station here to cost $125,000, and it will not go before the railway board.

OAKVILLE, ONT.—The Dominion Gas & Fuel Co. contemplates building a gas plant here to cost $300,000.

OTTERVILLE, ONT.—Otterville Canners, Ltd., has been incorporated to operate a canning plant, $50,000 capital, by Herbert G. Downing, Charles Daiken and Leith O. Howse.

TORONTO, ONT.—Base-O-Lite Product, Ltd., has been incorporated to manufacture electrical appliances by Fred I. Green, Perch S. Bysshe and Perry Briadbent.

TORONTO, ONT.—The Toronto transportation commission will build a garage at Bathurst street and Davenport road, to cost $150,000. The general contract has been awarded to Jackson-Lewis Co., Ltd., Toronto.

TORONTO, ONT.—Dodge Brothers (Canada), Ltd., is installing equipment in the building formerly occupied by the Canadian Airplanes, Ltd., on Dufferin Street and will shortly be assembling cars for the Canadian and British Empire markets.

TORONTO, ONT.—The S. K. F. Co. proposes to build a factory on Bay Street, for the manufacture of ball bearings, etc.

TORONTO, ONT.—Little Wonder Fuel Saver Co. of Ontario. Ltd., has been incorporated with $40,000 capital to manufacture a fuel saving device, by Alan J. P. Cameron, Beatrice B. Cameron Adam A. Lind.

TORONTO, ONT.—Walker Wallace, Ltd., has been incorporated with $30,000 capital to manufacture dairy and similar machinery by Kenneth L. Wallace, James Parker and Maurice Crabtree.

TORONTO, ONT.—Heat & Humidity, Ltd. has been incorporated with $50,000 capital to manufacture heating and humidifying apparatus by Robert Gowans, Charles D. Magee and Ernest H. Stewart.

TORONTO, ONT.—Electric Steam Radiators, Ltd., has been incorporated with $150,000 capital to manufacture electro-vapor radiators and electro-therapeutic appliances by Frederick H. Blakely, Fraser K. Wilson and Wilfrid A. Toogood.

WINDSOR, ONT.—Pastorius-McPhail Bearing Co. Ltd. has been incorporated with $40,000 capital to manufacture roller bearings and iron and brass castings by James E. Pastorius, Catherine Pastorius and Duncan McPhail.

WINDSOR, ONT.—Christian Electric Co. of Canada, Ltd., has been incorporated with $60,000 capital to manufacture electric apparatus and machinery by Edward C. Kenning, Bruce Williams and Ellen M. Stark.

RIVIERE DU LOUP, QUE.—The St. Lawrence Furniture Co. will require tools and woodworking equipment for factory now under construction.

ST. JOSEPH D'ALMA, QUE.—Daigle & Paul, Ltd., Verdun, Que., have been awarded the contract for millwork in connection with $2,000,000 paper mill to be erected here for Price Bros., Ltd. William L. Bishop, Ltd., has the general contract.

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. works

Pennsylvania, No. 1	$43.00 to 46.00
Pennsylvania, No. 2	40.00 to 43.00
Ohio, No. 1	43.00 to 46.00
Ohio, No. 2	40.00 to 43.00
Illinois, No. 1	43.00 to 45.00
Illinois, No. 2	40.00 to 43.00
Kentucky, No. 1	43.00 to 45.00
Kentucky, No. 2	40.00 to 43.00
Missouri, No. 1	40.00 to 42.00
Missouri, high grade	48.00 to 50.00
Maryland, No. 1	43.00 to 47.00
Maryland, No. 2	39.00 to 42.00

SILICA BRICK

Pennsylvania	$40.00
Chicago	49.00
Birmingham	48.00 to 52.00

MAGNESITE BRICK

Per Net Ton Seaboard Base

9 x 4½ x 2½	$65.00

CHROME BRICK

(Per Net Ton)

9 x 4½ x 2½	$48.00

New Trade Publications

PUNCHES AND SHEARS—Long & Allstatter Co., Hamilton, O., as issued a bulletin covering its line of punches, shears, sprue cutters, riveters, bending rolls and other heavy duty equipment.

COLD DRAWN STEEL—A catalog of its various brands of high grade cold drawn steel has been issued by the Anchor Drawn Steel Co., Latrobe, Pa. Much information as to qualities and forms is given.

POWER PRESSES—Double crank presses for large cutting, punching, bending, stamping and forming dies are portrayed in a bulletin by the Niagara Machine & Tool Works, Buffalo. Other sheet metal working tools are also described.

PERMANENT MOLD CASTINGS—A process of making aluminum castings up to 17 pounds weight in permanent molds, with claims of excellence in quality of metal is described in a circular by the Permold Co., Cleveland.

PORTABLE ELEVATORS—Machine piling as a money and man saver no longer is an experiment and the Barrett-Cravens Co., Chicago, has issued a catalog presenting its governor controlled, gear enclosed portable elevator, well illustrated to cover the field of its operations. Details of construction and operation are given clearly and fully.

COKE RECLAMATION—People who have tried to burn ashes have failed to get results but most ashes contain enough fuel to pay for separation and the Ash Reclaiming Machinery Corp., New York, presents in a bulletin some interesting figures from actual performance in coke plants where its coke separator has been in use.

MILLING MACHINE—A new design of milling machine by the Kearney & Trecker Corp., Milwaukee, Wis., is described in a bulletin just issued. A feature of the miller is the location of the motor in the base, with direct drive through a friction clutch. The various points of the machine are described in detail.

REFRACTORIES—A treatise on the building of monolithic furnace linings is presented in its second edition by the Plibrico Jointless Firebrick Co., Chicago. Causes of furnace trouble, solutions of the trouble and tests of the material are presented. Temperature charts with various materials indicate differences in radiation. Illustrations present various steps in applying the material and views are given of various jobs in process and completed.

INDUSTRIAL BUILDING—Calling it "the picture book of a new profession," the H. K. Ferguson Co., Cleveland, has issued a handsomely illustrated book to show how modern industrial building is planned and executed to give the best results to the business for which the structure is built. The recently developed system of standard buildings which can be erected in units and added to as need requires is given a portion of the book.

STEEL STAMPINGS—On its twenty-fifth anniversary the E. R. Wagner Mfg. Co., North Milwaukee, Wis., published a commemorative booklet dealing with its plant policy and history, illustrated by views of various departments. The growth of the company from its small beginning, the first year of the century, is traced and may serve as a guide to other small concerns now making their beginning.

WIRE CLOTH—A liberal education in the uses and manufacture of wire cloth in many metals is afforded readers of the catalog of 64 pages issued by the Newark Wire Cloth Co., Newark, N. J. Among the specialties described are metallic filter cloth and various sizes of monel metal wire cloth. United States standard testing sieves are given considerable attention. A chapter is devoted to foundry riddles and dipping baskets. Tables of value to users of wire are included.

Discounts and Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount of $4 per ton higher net.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis or $5 per ton higher net.

	Black	Galvanized
Butt Weld		
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	46	42½
¾-inch	60	48½
1 to 3 -inch	62	50½
Lap Weld		
1-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	60	48½
Lap Weld		
2-inch	53	41½
2½ to 6-inch	57	45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½
Lap Weld		
2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½
Lap Weld		
2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis

THREADS AND COUPLINGS		
Butt Weld		
¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
3 to 6-inch	28	13
7 to 12-inch	26	11
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
Butt Weld		
¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
8 to 12-inch	16	2
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	+47½	+59½
½-inch	+28	+40
1-inch	+34	+40
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½ inches	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	

Boiler Tubes

Pittsburgh less carload discounts. Carload 4 points larger

STEEL (Lap Welded)	
2 and 2¼-inch	23 off
2½ and 2¾-inch	33 off
3-inch	36 off
3¼ to 3¾-inch	38½ off
4 to 13-inch	42 off
CHARCOAL IRON	
1½-inch	+22
1¾-inch	+12
2 and 2¼-inch	+ 2
2½ to 3-inch	3
3¼ to 4½-inch	5
SEAMLESS COLD DRAWN	
1-inch	56 off
1¼ and 1½-inch	48 off
1¾-inch	32 off
2 and 2¼-inch	27 off
2½ and 2¾-inch	35 off
3-inch	41 off
3¼ and 3½-inch	43 off
4-inch	46 off
4½, 5 and 6-inch	41 off
SEAMLESS HOT ROLLED	
2 and 2¼-inch	30 off
2½ and 2¾-inch	38 off
3-inch	44 off
3¼ and 3½-inch	46 off
4-inch	49 off
4½,5 and 6-inch	44 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts

Carbon, 0.10 to 0.20 per cent ..... 83 off
Carbon, 0.30 to 0.40 per cent .... 81 off
Carbon, 0.40 to 0.50 per cent....net price
Plus differentials and extras for cutting.

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Outside diameter	Net prices per foot f.o.b. Pittsburgh Gage	Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2½-inch	10-gage	18c
3-inch	7-gage	33c
5⅜-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for long lengths.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, dated Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge, (except for ¼ inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per Pound for Width or Diameter

All Plates, Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square feet, if ordered to weight—

Over 100 inches to and including 110 inches	.05c
Over 110 inches to and including 115 inches	.10c
Over 115 inches to and including 120 inches	.15c
Over 120 inches to and including 125 inches	.25c
Over 125 inches to and including 128 inches	.50c

Plates less than ¼-inch or lighter than 11 pounds per square foot.

Over 72 inches to and including 84 inches	.10c
Over 84 inches to and including 96 inches	.20c
Over 96 inches to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼ inch thick and heavier.

GAGE

Plates not Exceeding 72 inches Wide

Plates less than ¼-inch gage, to and including ⅛-inch; or lighter than 10.2 pounds per square foot to and including 7.65 pounds per square foot ..... .20c

Plates Over 72 inches Wide

Plates less than ¼-inch gage to and including ⅛-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds per square foot ..... .20c
Plates ordered 7.65 pounds per square foot ..... .30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c

Hull material subject to U. S. Navy Dept. Specifications for Medium or Soft Steel ..... .10c
High tensile hull steel subject to U. S. Navy Dept., or equivalent specifications 1.00c
Boiler steel subject to U. S. Navy Dept. Specifications, classes A and B... 1.50c
Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.

Floor Plates

Checkered plates 1.75c
Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection .....No extra
Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH or DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet..No extras

Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.25c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts. (including straight taper plates)
Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with re-entrant angles)
Additional extra ..... .20c

Sivyer Alloy Electric Steel Castings can be forged, welded and tempered.

SIVYER (S) CASTINGS

DEPENDABLE

A reamer-body used in connection with a rotary oil-well drill. Cast in Sivyer Chrome Nickel Electric Furnace Steel.

Sivyer Alloy Steels for Parts That Must Not Break

ON many pieces of equipment, there is often some one part — or parts — that must withstand excessive wear without breaking, if trouble-free service is to be assured. The reamer-body, pictured above, and the bit-head used with it are excellent examples of two such parts. Their job is to carry a roller-bit through hard rock formations with only "slush" lubrication. And they must not break, for breakage entails the danger of losing the hole. Ordinary steel was tried, but it could not stand the "gaff" of hard rock drilling. The logical thing to do was to make these parts that must not break, of some metal that will not break. The result is that they are now cast in Sivyer Chrome Nickel Electric Steel. The manufacturer reports that his drills have cut through as much as 400 feet of rock, on "slush" lubrication, without a single lifting of the tools for repairs or bit changes.

Why Sivyer Alloys Defeat Hard Wear

The exceptional wear resisting qualities of the reamer-body and bit-head described in the right-hand column, are illustrated by the high physical properties of Sivyer Chrome Nickel Electric Steel in the annealed state.

Tensile strength	100,000 lbs.
Yield Point	65,000 lbs.
Elongation in 2 inches	19%
Reduction in area	30%

To further increase these qualities many manufacturers subject their Sivyer Chrome Nickel Castings to heat treatments after they have been machined. This gives the part a tensile strength that is at least twice that of ordinary steel while the resistance to wear is easily trebled.

The exceptional strength of Sivyer Chrome Nickel Steel and other Sivyer alloys is leading many manufacturers to turn to those metals to rid themselves of the costly breakage and excessive wear that are often the lot of parts subjected to hard service.

Send Blue Prints

If you are having trouble with some of your parts—excessive breakage, rapid wear, rejections, failures in service, interior defects—send blue prints of them to us. We will gladly render recommendations without obligations on your part.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

Iron and Steel Freight Rates

Finished Material

Pittsburgh, 100 pounds, carloads, to:	
Atlanta	$0.58
Baltimore	.31
Birmingham	.58
Boston	.365
Buffalo	.265
Chattanooga	.50
Chicago	.34
Cincinnati	295
Cleveland	.19
Columbus	.255
Dallas (tin plate .90)	1.02
Denver	1.15
Detroit	.295
Duluth	.60
Indianapolis	.31
Kansas City	.735
Louisville	.33
Milwaukee	.37
Minneapolis and St. Paul	.60
New Orleans	.67
New York	.34
Omaha	.735
Pacific coast (tin plate)	.90
Pacific coast (all rail)	1.15
Philadelphia	.32
South Bend, Ind.	.32
St. Louis	.43
Toledo	.27
Topeka	.85
Youngstown	.11
Chicago, Gary, Indiana Harbor, Evanston, Joliet, and Waukegan to:	
Aberdeen, S. D.	$0.55
Ashland, Wis., and Duluth	3.05
Atlanta	.58
Beaumont (pipe .49)	.68
Birmingham	.53
Cairo, Ill.	.245
Caspar, Wyo. (pipe .835)	1.00
Cedar Rapids, Iowa (wire .345)	.245
Chattanooga	.49
Dallas (pipe .69)	.84
Denver	.83
Des Moines, Iowa	.295
Detroit	.275
Evansville, Ind.	.28
Grand Rapids, Mich	.26
Green Bay, Manitowoc, Wis.	.205
Indianapolis (pipe .25)	.155
Kalamazoo, Mich	.22
Kansas City (pipe .35)	.415
Madison, Wis.	.115
Memphis (all rail)	.42
Memphis (rail and river)	.35
Milwaukee	.08
Minneapolis, St. Paul; Waterloo, Iowa	.275
Muskogee, Okla. (pipe .60)	.69
New Orleans (all rail)	.57
New Orleans (rail and river)	.47
Omaha (pipe .35)	.415
Pacific Coast (tin plate. 75)	1.00
Peoria (pipe .155)	.13
Pine Bluff, Ark. (pipe .55)	.46
Rock Island, Ill.	.155
Sioux City, Iowa, St. Joseph, Mo., and other Missouri river points (pipe .35)	.415
South Bend, Ind. (sheets .13)	.185
St. Louis	.175
St. Paul	.275
Terre Haute, Ind. (pipe .24)	.155
Topeka, Kans. (pipe .435)	.51
Tulsa, Okla. (pipe .60)	.69
Waterloo, Iowa	.275
Cleveland to:	
Akron	$0.09
Atlanta	.57
Baltimore	.37
Boston	.43
Buffalo	.25
Canton	.095
Chattanooga	.50
Chicago	.30
Cincinnati	.27
Columbus	.215
Detroit (rail)	.235
Indianapolis	.28
New Orleans	.65
New York	.40
Philadelphia	.38
St. Louis	.36
Toledo	.20
Youngstown to:	
Akron	$0.095
Atlanta	.58
Baltimore	.345
Beaumont, Tex. (pipe .67)	.87
Boston	.405
Buffalo	.25
Canton	.095
Caspar, Wyo.	1.15
Chattanooga	.50
Chicago	.32
Cincinnati	.285
Cleveland	.095
Coffeyville, Kans.	.87
Columbus	.25
Dallas (pipe .855)	1.02
Denver (pipe. 1.115. Min. 60,000 lbs.	1.13
Detroit	.265
Indianapolis	.30
Little Rock, Ark. (pipe .75)	.70
Memphis	.54
New Orleans	.66
New York	.375
Pacific coast	1.15
Philadelphia	.355
Shreveport, La. (Pipe .84)	.79
Smackover, Ark. (Pipe .82)	.77
St. Louis	.38
Toledo	.24
Tulsa, Okla. (Pipe .855)	.87
Wichita, Kans. (pipe .855)	1.02
Lorain to:	
Atlanta	$0.57
Bakersfield, Long Beach, and Los Angeles	1.15
Beaumont, Tex.	.655
Caspar, Wyo.	1.125
Chattanooga	.50
Chicago	.36
Cincinnati	.265
Cleveland	.07
Coffeyville, Kans.	.70
Dallas	.84
Detroit	.215
Kansas City	.63
New Orleans	.65
*Shreveport, La.	.76
Smackover, Ark.	.77
St. Louis	.355
Tulsa, Okla.	.84
Wichita	.84

*Minimum 80,000 pounds.

From:	Coatesville, Pa.	Bethlehem, Pa.	Harrisburg Pa.
To:			
Baltimore	$0.145	$0.19	$0.145
New York	.175	.145	.19
Philadelphia	.10	.13	.145
From:	**Lebanon, Pa.**	**Phoenixville, Pa.**	**Pottsville, Pa.**
To:			
Baltimore	$0.155	$0.155	$0.19
New York	.10	.175	.19
Philadelphia	.13	.095	.145
From	**Johnstown, Pa.**	**Claymont, Pa.**	**Pencoyd. Pa.**
To:			
Baltimore	$0.285	$0.145	$0.155
New York	.32	.175	.175
Philadelphia	.295	.08	.06

To:— From Pennsylvania	Boston	Worcester	Providence	New Haven
Catesville	$0.255	$0.255	$0.255	$0.255
Harrisburg	.255	.255	.255	.255
Johnstown	.350	.350	.350	.350
Philadelphia	.255	.255	.255	.255
Phoenixville	.255	.255	.255	.255
Pittsburgh	.365	.365	.365	.365
Pottsville	.255	.255	.255	.255
Reading	.255	.255	.255	.255
South Bethlehem	.255	.255	.255	.255

New York				
Buffalo	.345	.345	.345	.345
Lackawanna	.345	.345	.345	.345
Syracuse	.310	.310	.310	.310
Tonawanda	.345	.345	.345	.345
New Jersey				
Perth Amboy	.255	.255	.245	.245
Ohio				
Youngstown	.405	.405	.405	.405
Connecticut				
Collinsville	.220	.210	.215	.160
Southington	.220	.205	.210	.140
Rhode Island				
Phillipsdale	.165	.165	.110	.215
Massachusetts				
Danvers	.750	.100	.195	.225
Fitchburg	.950	.145	.185	.220
W. Wareham (R. R. Station Treamount)	.165	.190	.165	.220
Worcester	.165	...	.165	.165

Pig Iron

Mahoning and Shenango valleys to:	
Boston	6.43
Chicago	4.79
Cleveland	$1.76
Minneapolis, St. Paul	7.83
Newark, N. J.	6.03
Philadelphia	5.63
Pittsburgh	1.76
St. Louis	5.80
Buffalo to:	
Albany, N. Y.	$2.27
New England (rail)	4.91
New York and Brooklyn (rail)	4.91
Philadelphia	4.91
Rochester	1.39
Virginia furnaces to:	
Brooklyn, Jersey City, Newark	5.54
New England	5.92
Philadelphia	$5.17
Birmingham, Ala., to:	
Boston (rail)	$9.61
Boston (rail and water)	6.91
Chicago	6.01
Cincinnati	4.05
Cleveland	6.01
Jersey City	8.05
Louisville, Ky.	3.72
Minneapolis, St. Paul	8.77
New York	9.24
Newark	8.28
Philadelphia (rail)	7.81
Philadelphia (rail and water)	6.01
Pittsburgh	6.84
St. Louis	5.17
Chicago to:	
Des Moines	$4.24
Milwaukee	1.00
Minneapolis, St. Paul	3.04
Moline, Ill.	1.76
Omaha	4.97
St. Louis	2.16
Ironton and Jackson, O., to:	
Chicago	$4.79
Cincinnati	2.27
Cleveland	3.02
Detroit	3.21
Indianapolis	2.90
Minneapolis, St. Paul	7.83

Export Rail Rates

Manufactured Iron and Steel

Cents per 100 pounds in Carloads

From	To New York	To Baltimore	To Boston	To Philadelphia	To Pacific Coast
Chicago	$42.50	$39.50	$42.50	$40.50	$50.00
Cincinnati	37.00	34.00	37.00	35.00	72.00
Cleveland	30.00	27.00	30.00	28.00	72.00
Pittsburgh	25.50	22.50	25.50	23.50	72.00
South Bethlehem	11.00	14.50	...	10.00	...
Wheeling	25.50	22.50	25.50	23.50	72.00
Youngstown	28.50	25.50	28.50	26.50	72.00

Billets

Per Gross Ton

From	To New York	To Baltimore	To Boston	To Philadelphia	To Pacific Coast
Chicago	$7.10	$6.50	$7.10	$6.70	$11.20
Cincinnati	6.20	5.60	6.20	5.80	16.13
Cleveland	5.00	4.40	5.00	4.60	16.13
Pittsburgh	4.30	3.70	4.30	3.90	16.13
Wheeling	4.30	3.70	4.30	3.90	16.13
Youngstown	4.70	4.10	4.70	4.30	16.13

Rails

Per Gross Ton

From	To New York	To Baltimore	To Boston	To Philadelphia	To Pacific Coast
Chicago	$6.75	$6.15	$6.75	$6.35	$11.20
Pittsburgh	4.00	3.70	4.00	3.80	15.46
Youngstown	4.20	3.90	4.20	4.00	...